Attorney Docket No. 51590.62072 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Pasternak et al.	Confirmation No.	3048
U.S. Serial No.	09/806,645	Examiner:	Wang, Shengjun
Filed:	July 12, 2001	Group Art Unit:	1617
For:	TOPICAL COMPOSITION COMPRISING AN OPIOID ANALGESIC AND AN NMDA RECEPTOR ANTAGONIST		

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CERTIFICATION UNDER 37 C.F.R. §1.10

Date of Deposit: November 16, 2006 Mailing Label Number: EV 749289715 US

I hereby certify that this document is being deposited with the United States Postal Service on the date indicated above in an envelope as "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 and addressed to the MS RCE, P.O. Box 1450, Alexandria, VA 22313-1450.

Deborah Clark
Name of Person Mailing Paper

Deborah J Clark
Signature of Person Mailing Paper

DECLARATION OF GAVRIL W. PASTERNAK, M.D. PH.D

I, Gavril W. Pasternak, declare as follows:

1. I hold the position of Attending Neurologist and Head of the Laboratory of Molecular Neuropharmacology at Memorial Sloan-Kettering Cancer Center. I also hold the position of Professor of Neurology & Neuroscience, Pharmacology and Psychiatry at the Weill College of Medicine of Cornell University. I am an inventor of U.S. Patent Application No. 09/806,645 ("the present application"). I am familiar with the present application and its filing. My curriculum vitae is attached under Tab A. I respectfully submit that I am qualified to speak and render opinions as to the disclosure in the present application and the state of the

art, as I am considered an expert in the field and have familiarity with the present application and its prosecution.

2. I am familiar with the Office Action dated January 18, 2006, and the Advisory Action dated May 5, 2005, both issued by the United States Patent and Trademark Office in connection with the present application and make this Declaration in response thereto. I understand that the Examiner questions whether one of ordinary skill in the art could extrapolate the data generated using the tail-flick assay in the present application to "any topical area of any mammal" particularly a human.

3. I hold the opinion that one of ordinary skill in the art would be able to extrapolate the data generated using the tail-flick assay in the present application to the topical area of a mammal, particularly a human.

4. The tail-flick assay described in the present application has been in use by those of skill in the art since about 1943.

5. The tail-flick assay was chosen to evaluate the invention of the present application because the neuroanatomy and neurophysiology of the skin innervating the tail of both rats and mice closely mimics that of human skin.

6. In the tail-flick assay, nociceptive stimuli is administered to the tail of the rodent which elicits a neurophysiological response.

7. The neurophysiological response generated by the tail-flick assay is predictive of the response in other mammals, including humans.

8. As of July 16, 1998, the tail-flick assay was validated as a predictor for analgesic activity in humans for a wide range of analgesic agents.

9. As of July 16, 1998, the tail-flick assay was accepted by those of skill in the art for its reliability in predicting clinical outcome of opioid analgesics, morphine and morphinomimetic compounds in other mammals, including humans.

10. I understand that the Examiner also questions whether the description on page 20, lines 1-10 and lines 23-25, of the specification suitably describes a method in which the active agents of the invention (e.g., ketamine and morphine) are delivered to local peripheral receptors and not to central receptors. This passage describes certain results relating to the tail immersion technique. Briefly, it was determined that proximal segments of the tail which were not exposed to an opioid solution were not analgesic, confirming the peripheral site of action for the sites immersed in the opioid solution. This finding confirmed the distribution studies with ^{125}I-opioid, which documented the localization of the radiolabel only to the regions immersed in drug solution and the absence of any significant uptake into the blood or the central nervous system. One skilled in the art would instantly recognize that this passage describes a method in which the active agents of the invention are effectively delivered to local peripheral receptors and not to central receptors.

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11. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful statements

Dated 15 November 2006 By:

Gavril W. Pasternak, MD PhD

Anne Burnett Tandy Chair in Neurology
Member and Attending Neurologist
Head, Laboratory of Molecular Neuropharmacology
Memorial Sloan-Kettering Cancer Center

Professor of Neurology & Neuroscience, Pharmacology and Psychiatry
Weill College of Medicine of Cornell University

Tel: 646 888-2165
Fax: 646 422-0271

Curriculum Vitae **Gavril W. Pasternak, M.D., Ph.D.**

Date/Place of Birth 29 June 1947; Brooklyn, N.Y.
Nationality United States of America

Professional Address Memorial Sloan-Kettering Cancer Center
1275 York Avenue
New York, NY 10021

Tel (646) 888-2165
Fax (646) 422-0271
e mail: pasterng@mskcc.org

Home Address 500 East 83rd Street, Apt 21M
New York, NY 10021

Licensed Physician Maryland 1977 (Inactive)
New York 1979

Board Certification Neurology, American Board of Psychiatry and Neurology 1980

Education
Johns Hopkins University (Baltimore, Maryland),
1969, B.A. Chemistry
Johns Hopkins University School of Medicine,
1973, M.D.
1975, Ph.D. Pharmacology and Experimental Therapeutics

Postdoctoral Training
Johns Hopkins School of Medicine
1974-75, Fellow, Pharmacology and Experimental Therapeutics
Johns Hopkins Hospital
1975-76, Intern in Medicine
1976-78, Assistant Resident, Resident, Fellow in Neurology

Current Appointments

Memorial Sloan-Kettering Cancer Center
Member (1989-present)
Anne Burnett Tandy Chair of Neurology (2005-present)
Memorial Hospital
Attending Neurologist, Dept. of Neurology (1989-present)
Attending Physician, Pain Service, Dept of Neurology (1989-present)
Sloan-Kettering Institute
Member (1989-present)
Head, Laboratory of Molecular Neuropharmacology
Weill Medical School of Cornell University
Professor of Neurology and Neuroscience (1989-present)
Professor of Pharmacology (1989-present)
Professor of Psychiatry (1998- present)
Weill Graduate School of Medical Sciences of Cornell University
Professor of Neurology and Neuroscience (1989-present)
Professor of Pharmacology (1989-present)
Professor of Molecular Pharmacology and Therapeutics (1990-present)
Co-Director, Summer Minority Science Program (1994-2003)
The New York Hospital
Attending Neurologist (1989-present)

Previous Appointments

Memorial Sloan-Kettering Cancer Center
Associate Member (1984-1989)
Memorial Hospital
Assistant Attending Neurologist Dept of Neurology (1979-1985)
Assistant Attending Physician, Pain Service, Dept Neurology (1979-1985)
Associate Attending Neurologist Dept of Neurology (1985-1989)
Associate Attending Physician, Pain Service, Dept Neurology (1985-1989)
Sloan-Kettering Institute for Cancer Research
Research Associate (1979-1984)
Associate Member (1988-1989)
Cornell University Medical College
Assistant Professor of Neurology (1979-1983)
Assistant Professor of Pharmacology (1979-1984)
Associate Professor of Neurology (1983-1989)
Associate Professor of Pharmacology (1984-1989)
Cornell University Graduate School of Medical Sciences
Director (1989-1992)/Co-Director (1992-1997),
Graduate Program of Neuroscience
The New York Hospital
Assistant Attending Neurologist (1979-1983)
Associate Attending Neurologist (1983-1989)

Professional Societies

American Neurological Association
American Academy of Neurology, Fellow
American Society for Pharmacology & Experimental Therapeutics
College of Problems of Drug Dependence
American Association for the Advancement of Science
International Association forthe Study of Pain
American Pain Society
Eastern Pain Association
New York Academy of Sciences
Phi Beta Kappa
Sigma Xi Scientific Society
Society for Neuroscience
The Harvey Society

Honors

2006	1st Annual Machaskee Memorial Lectureship, Cleveland Clinic Cleveland, OH
2002-06	Listed, "Best Doctors in America", by Best Doctors, Inc.
2005	Anne Burnett Tandy Chair in Neurology, MSKCC
2004-09	Senior Scientist Award, National Institute on Drug Abuse
2002	The Millennium Prize 2002 and Lecture, by the Faculty of Medicine, Norwegian University of Science and Technology
2002	Listed, "Highly Cited Researchers", by ISI/Thomson Scientific (Original Member)
2001	US Lacrosse (Men's Division Coaches Council, Secondary Schools Metro Division): Man of the Year
2001	The John J. Bonica Award of the Eastern Pain Association.
1999-04	Senior Scientist Award, National Institute on Drug Abuse
1997	Wellcome Visiting Professor in the Basic Medical Sciences, U. of South Florida
1996	MERIT Award, National Institute on Drug Abuse (DA07242)
1994-99	Research Scientist Award, National Institute on Drug Abuse
1993	Elected to the Johns Hopkins University Society of Scholars
1990	Visiting Professor, Department of Anesthesiology, U. of California, San Diego
1990	Visiting Professor, Departments of Anesthesiology and Neuroscience, U. Cincinatti Med Center
1989	Sally Harrington Goldwater Memorial Visiting Professor, Barrow Neurological Institute
1989	Research Scientist Development Award, National Institute on Drug Abuse
1988	Lilly Clinical Scholar and Visiting Professor
1987-92	Board of Scientific Counselors, National Institute on Drug Abuse
1987	Tenth Annual Eino Nelson Memorial Conference Lecturer
1987	Louise and Allston Boyer Young Investigator Award for Clinical Investigation, Memorial Sloan-Kettering Cancer Center
1987	Visiting Professor, Department of Neurology, Loyola U. Stritch School of Medicine
1986	Visiting Professor, Department of Neurology, New Jersey Medical School
1984	Fellow, American Academy of Neurology
1984	Granito Memorial Lecture, New Jersey Pharmaceutical Association
1983	Visiting Professor, Department of Neurology, Tufts New England Medical Center
1980	S. Weir Mitchell Award of the American Academy of Neurology
1979-84	Teacher-Investigator Award (NINCDS)
1974	Drug Abuse Center Fellowship Award
1971	Insurance Medical Scientist Scholarship Award
1969	Phi Beta Kappa
1968	Phi Lambda Upsilon, Honorary Chemical Society
1968	Alpha Epsilon Delta, Honorary Premedical Society
1965	Bausch & Lomb Science Award

Editorial Responsibilities

Journals

J. Pharmacology & Experimental Therapeutics.	Editorial Advisory Board, (1988-)
Molecular Pharmacology.	Editorial Board (1998-)
Brain Research	Editorial Board (2002-2006)
	Board of Reviewing Editors (2006-)
Life Sciences.	Editorial Advisory Board (1984-)
Cellular and Molecular Neurobiology.	Editorial Board (1987-)
Synapse.	Editorial Board (1994-)
Analgesia Reviews (previously **Analgesia)**	Editorial Board (1994-)
Neuroscience-Net.	Editorial Board (1996-)
Palliative Medicine	Editorial Advisory Board (2002-)
Neuropharmacology	Executive Editor (1998-);
	Editorial Board (1987-1992)
BioTechniques	Editorial Board (1990- 1996)
Receptors and Signal Transduction	Editorial Board (1989-1998)
The Pain Clinic Journal.	Editorial Board (1988-1998)
PharmacologyOnLine	Editorial Board (2006-
Faculty of 1000	Editorial Board (2006-

Books: **Analgesics: Neurochemical, Behavioral and Clinical Perspectives**
M.J. Kuhar and G.W. Pasternak, editors, Raven Press, New York, 1984.
The Opiate Receptors, G.W. Pasternak, editor, Humana Press, New York, 1988.

Patents

#4,608,376: Opiate agonists and antagonists
#4,803,208: Opiate agonists and antagonists
#5,747,279: Nucleic acid molecules encoding kappa$_3$ receptors, receptors encoded thereby, and uses thereof
#6,509,028: Methods and compositions for treating pain of mucous membrane
#6,500,927: Identification and characterization of multiple splice variants of the mu-opioid receptor gene
#6,627,734: Identification and characterization of multiple splice variants of the kappa3-related opioid receptor (KOR-3) gene
#6,660,496: Nucleic acid molecules encoding a KOR3 kappa opioid receptor and the methods of producing the encoded receptor
#6,790,855: Topical anesthetic/opioid formulations and uses thereof
#6,825,203: Topical anesthetic/opioid formulations and uses thereof
#7,087,714: Mu-Opiod receptor splice variant polypeptides

Extramural Activities

National Institute on Drug Abuse
Board of Scientific Counselors (1987-1992)
Molecular, Cellular and Chemical Neurobiology Study Section
Chairman (1994-1996)
Member (1992-1996)
National Institutes of Health
Molecular, Developmental and Cellular Neuroscience (MDCN5) Study Section
Member (1999- 2003)
Ad Hoc Reviewer (1996-1999; 2003-present)
American Academy of Neurology
Auxiliary Awards Committee (1994-1998)
American Association Advancement of Science; Medical Sciences Section (1990-1994)
New York Academy of Sciences; Conference Committee (1988-1994)
Johns Hopkins University
National Alumni Schools Committee (1990-present)
Alumni Council (1998-2001)
External Advisory Committee, Specialized Neuroscience Research Program,
Hunter College (2001-present)
Farber Institute for the Neurosciences of Thomas Jefferson University
Member, External Scientific Advisory Board (2003 present)
EpiCept Corporation (Englewood Cliffs, NJ)
Member and Chairman, Scientific Advisory Board (1999- present)
Synt:em Corporation (Nimes, France)
Member, Scientific Advisory Board (2000- 2006)
Director-At-Large, Eastern Pain Association (2002- 2004)
Limerick NeuroSciences Inc.
Member, Scientific Advisory Board (2006 present)

Intramural Activities

Memorial Hospital
Institutional Review Board (1983-1987; 1989-1995)
Credentials Committee (1993-2004); Chairman (1999- 2004)
Memorial Hospital Committee on Credentials, Appointments and Promotions (MHCCAP)
Co-Chair (2004–present)
Member, Memorial Hospital Medical Board (1999-2005)
Member, MSKCC Committee on Appointments and Promotions (1999-present)
Research Council (1997-2001)
Sloan-Kettering Institute
Executive Committee, Program of Molecular Pharmacology and Chemistry
(1989-present)
Chairman, Institutional Animal Care and Use Committee (IACUC) (1999-present)
Cornell U. Medical College/New York Hospital
Executive Committee, Department of Neurology (1992-1997)
M.D.-Ph.D. Program
Executive Committee (1993-1996)
Admissions Committee (1996-1999)
Cornell U. Graduate School of Medical Sciences
Director (1989-1992)/Co-Director (1992-1997), Program in Neuroscience
Faculty Advisory Committee (1989-1997); Vice-Chair (1996-1997)
Executive Advisory Committee (1996-1997)
Curriculum Committee, Program in Neuroscience (1989-1992)
Credentials Committee, Program in Neuroscience (1989-1995)
Admissions Committee, Program in Neuroscience (1989-1997)

Marital Status:	Sandra F. Pasternak (deceased)
Dependents	Katie Rachael Pasternak David Avram Pasternak Anna Rose Pasternak

I. Published Papers

1. PASTERNAK GW. Differentiation and characterization of opiate agonist and antagonist binding. Doctoral Dissertation, Johns Hopkins University, Baltimore, Maryland, 1974.

2. COWAN DO, PASTERNAK GW and KAUFMAN F. Biological electron transport systems. Proc. Nat. Acad. Sci. USA, 66: 837-843, 1970.

3. HARIK SI, PASTERNAK GW and SNYDER SH. An enzymatic isotopic microassay for putrescine. Biochem. Biophys. Acta, 304: 753-764, 1973.

4. PERT CB, PASTERNAK GW and SNYDER SH. Opiate agonists and antagonists discriminated by receptor binding in brain. Science, 182: 1359-1361, 1973.

5. HARIK SI, PASTERNAK GW and SNYDER SH. Putrescine: a sensitive assay and blockade of its synthesis by hydrazino-ornithine. In Polyamines in Normal and Neoplastic Growth D.H.Russell (Ed.). New York, Raven Press, 1973, p. 307-321.

6. PASTERNAK GW and SNYDER SH. Opiate receptor binding: effects of enzymatic treatments. Mol. Pharmacol. 10: 183-193, 1974.

7. PASTERNAK GW and SNYDER SH. The effect of enzymatic treatments on ^{3}H-Naloxone binding. Proc. Comm. Drug Dependence, 370-375, 1974.

8. PERT CB, PASTERNAK GW and SNYDER SH. Opiate agonists and antagonists discriminated by receptor binding in brain. Proc. Comm. Drug Dependence p. 376-382, 1974.

9. SNYDER SH, PERT CB and PASTERNAK GW. The opiate receptor. Ann. Int. Med. 81: 534-540, 1974.

10. PASTERNAK GW and SNYDER SH. Identification of novel high affinity opiate receptor binding in rat brain. Nature, 253: 563-565, 1975.

11. PASTERNAK GW, GOODMAN R and SNYDER SH. An endogenous morphine-like factor. In The Opiate Narcotics: Neurochemical Mechanisms in Analgesia and Dependence. A. Goldstein (Ed.), New York, Pergamon Press, 1975, p. 13-17.

12. CREESE I, PASTERNAK GW, PERT CB and SNYDER SH. Discrimination by temperature of opiate agonist and antagonist receptor binding. In The Opiate Narcotics: Neurochemical Mechanisms in Analgesia and Dependence. A. Goldstein (Ed.), New York, Pergamon Press, 1975, p. 85-90.

13. SNYDER SH, PASTERNAK GW and PERT CB. Opiate receptor mechanisms. In Handbook of Psychopharmacology, Vol. 5, L. Iversen, S. Iverson and S.H. Snyder (Eds.). New York, Plenum Press, 1975, p. 329-360.

14. SNYDER SH, PERT CB and PASTERNAK GW. Opiate receptor dynamics. In Proceedings of the IX Congress of the Collegium Internationale Neuropsychopharmacologicum, Paris, 7-12 July 1974, J.R. Boissier, H. Hippius and P. Pichot (Eds.). Amsterdam, Excerpta Medica 1975, p. 307-313.

15. GUARNIERI M, KRELL LS, McKHANN GM, PASTERNAK GW and YAMAMURA HI. The effects of cell isolation techniques on neuronal membrane receptors. Brain Res., 93: 337-342, 1975.

16. WILSON HA, PASTERNAK GW and SNYDER SH. Differentiation of opiate agonist and antagonist receptor binding by protein modifying reagents. Nature 253: 448-450, 1975.

17. TELL GP, PASTERNAK GW and CUATRECASAS P. Brain and caudate nucleus adenylate cyclase: effects of dopamine, GTP, E prostaglandins and morphine. FEBS Letters, 51: 242245, 1975.

18. MARCH SC, PASTERNAK GW, PARIKH I, SNYDER SH and CUATRECASAS P. Macromolecular Naloxone: a long-acting opiate antagonist. Proc. Comm. Drug Dependence, p. 607611,1975.

19. PASTERNAK GW and SNYDER SH. An endogenous morphine-like factor in mammalian brain. Proc. Comm. Drug Dependence, p. 460-470.

20. PASTERNAK GW, SNOWMAN AM and SNYDER SH. Selective enhancement of [^{3}H]-opiate agonist binding by divalent cations. Mol. Pharmacol., 11: 735744, 1975.

21. PASTERNAK GW, GOODMAN R and SNYDER SH. An endogenous morphine like factor in mammalian brain. Life Sci., 16: 1765-1769, 1975.

22. PASTERNAK GW, WILSON HA and SNYDER SH. Differential effects of protein-modifying reagents on receptor binding of opiate agonist and antagonists. Mol. Pharmacol., 11: 340351, 1975.

23. PASTERNAK GW and SNYDER SH. Opiate receptor binding: enzymatic treatments discriminate between agonist and antagonist interactions. Mol. Pharmacol. 11: 478484, 1975.

24. CREESE I, PASTERNAK GW, PERT CB and SNYDER SH. Discrimination by temperature of opiate agonist and antagonist receptor binding. Life Sci. 16: 183-1842, 1975.

25. PASTERNAK GW, SIMANTOV R and SNYDER SH. Characterization of an endogenous morphinelike factor (enkephalin) in mammalian brain. Mol. Pharmacol. 12: 504513, 1976.

26. PASTERNAK GW, MARCH S, PARIKH I, SNYDER SH and CUATRECASAS P. Macromolecular naloxone: a novel class of long-acting polymer drugs. Life Sci., 18: 977982, 1976.

27. SIMANTOV R, KUHAR M, PASTERNAK GW and SNYDER SH. The regional distribution of a morphinelike factor, "enkephalin," in monkey brain. Brain Res., 106: 189197, 1976.

28. SNYDER SH, SIMANTOV R and PASTERNAK GW. The brain's own morphine, "endorphin": a peptide neurotransmitter? Neurosci. Symp., l: 82-98, 1976.

29. PASTERNAK GW, SIMANTOV R and SNYDER SH. An endogenous morphine-like factor. In Tissue Responses to Addictive Drugs, Ford and Clouet (Eds.). New York, Spetrum Publications, 1976, p. 103-122.

30. RAWLINGS W, BYNUM TE and PASTERNAK GW. Pancreatic ascites: diagnosis of leakage site by endoscopic pancreatography. Surgery, 81: 363-365, 1977.

31. SNYDER SH, CHILDERS SR and PASTERNAK GW. Opiate receptors: A) functional heterogeneity demonstrated with an apparently irreversible naloxone derivative; B) regulation by guanine nucleotides. In Advances in Pharmacology and Therapeutics, Vol. 1: Receptors. J. Jacob (Ed.). New York, Pergamon Press, 1978, p. 39-46.

32. ARABI BA, PASTERNAK GW, HURKO O and LONG DM. Familial intradural arachnoid cysts. J. Neurosurg., 50: 826-829, 1979.

33. PASTERNAK GW, CHILDERS SR and SNYDER SH. Multiple opiate receptors: evidence for mediation of analgesia by a subpopulation ofreceptors. In Endogenous and Exogenous Opioid Agonists and Antagonists, E.L. Way (Ed.) New York, Pergamon Press, 1979, p. 113-116.

34. PASTERNAK GW, CHILDERS SR and SNYDER SH: Opiate analgesia: evidence for mediation by a subpopulation of opiate receptors. Science, 208: 514-516, 1980.

35. CORREA FMA, INNIS RB, ROUOT B, PASTERNAK GW and SNYDER SH. Fluorescent probes of α- and β-adrenergic and opiate receptors: biochemical and histochemical evaluation. Neurosci. Letters, 16: 433, 1980.

36. PASTERNAK GW and HAHN EF. Long-acting opiate agonists and antagonists: 14hydroxydihydromorphinone hydrazones. J. Med. Chem.,23: 674-677, 1980.

37. PASTERNAK GW. Multiple opiate receptors:^{3}H-ethylketocyclazocine receptor binding and ketocyclazocine analgesia. Proc. Nat. Acad. Sci. USA, 77: 3691-3694, 1980.

38. PASTERNAK GW, ZHANG A-Z and TECOTT L. Developmental differences between high and low affinity opiate binding sites: their relationship to analgesia and respiratory depression. Life Sci., 27: 1185-1190, 1980.

39. PASTERNAK GW, CHILDERS SR and SNYDER SH. Naloxazone, a long-acting opiate antagonist: effectson analgesia in intact animals and on opiate receptor binding in vitro. J. Pharmacol. Exp. Therap. 214: 455-462, 1980.

40. ZHANG A-Z and PASTERNAK GW. Mu and delta opiate receptors: correlation with high and low affinity opiate binding sites. Europ. J. Pharmacol 67: 323-324, 1980.

41. PASTERNAK GW. Endogenous opioid systems in brain. Amer. J. Med. 68: 157-159, 1980.

42. HAZUM E, CHANG KJ, CUATRESCASAS P and PASTERNAK GW. Naloxazone irreversibility inhibits the high affinity binding of [^{125}I]D-ala^{2}-D-leu^{5}-enkephalin. Life Sci., 28: 2973-2979, 1981.

43. ZHANG A-Z and PASTERNAK GW. Opiates and enkephalins: a common binding site mediates their analgesic actions in rats. Life Sci., 29: 843-851, 1981.

44. ZHANG A-Z, CHANG J and PASTERNAK GW. The actions of naloxazone on the binding and analgesic properties of morphiceptin (NH_2-Tyr-Pro-Phe-Pro- $CONH_2$), a selective mu-receptor ligand. Life Sci., 28: 2829-2836, 1981.

45. BUATTI MC and PASTERNAK GW. Multiple opiate receptors: phylogenetic differences.Brain Res., 218: 400-405, 1981.

46. ZHANG A-Z and PASTERNAK GW. Ontogeny of opioid pharmacology and receptors: high and low affinity site differences. Europ. J. Pharmacol., 73: 29-40, 1981.

47. PASTERNAK GW. Opiate, enkephalin and endorphin analgesia: relations to a single subpopulation ofopiate receptors. Neurology, 31: 1311-1315, 1981.

48. PASTERNAK GW, CARROLL-BUATTI M and SPIEGEL K. The binding and analgesic properties of a sigma opiate, SKF 10,047. J. Pharmacol. Exp. Therap., 219: 192-198, 1981.

49. PASTERNAK GW. The neuropharmacologyof pain. Urban Health, 10:32-33, 48, 1981.

50. WOLOZIN BL and PASTERNAK GW. Classification of multiple morphine and enkephalin binding sites in the central nervous system. Proc. Nat. Acad. Sci.USA, 78: 6181-6185, 1981.

51. PASTERNAK GW. Central mechanismsof opioid analgesia. Acupuncture and ElectroTher., 6: 135-149, 1981.

52. HAHN EF, CARROLL-BUATTI M and PASTERNAK GW. Irreversible opiate agonists and antagonists: the 14

hydroxydihydromorphinone azines. J.Neurosci., 2: 572-576, 1982.

53. SPIEGEL K, KOURIDES I and PASTERNAK GW. Prolactin and growth hormone release by morphine in the rat: different receptor mechanisms. Science 217: 745747, 1982.

54. CHILDERS SR and PASTERNAK GW. Naloxazone, a novel opiate antagonist: irreversible blockade of rat brain opiate receptors in vitro. Cell. Molec. Neurobiol., 2: 93103, 1982.

55. WOLOZIN BL, NISHIMURA S and PASTERNAK GW. The binding of kappa and sigma opiates in rat brain. J. Neurosci., 2: 708-713, 1982.

56. GALETTA S, LING GSF, WOLFIN L and PASTERNAK GW. Receptor binding and analgesic properties of oxymorphazone. Life Sci., 31: 1389-1392, 1982.

57. JOHNSON N, HOUGHTEN R and PASTERNAK GW. Binding of ^{3}H-β-endorphin in rat brain. Life Sci., 31: 1381-1384, 1982.

58. PASTERNAK GW. High and low affinity opioid binding sites relationship to mu and delta sites. Life Sci. 31: 1303-1306, 1982.

59. HAHN EF and PASTERNAK GW. Naloxonazine, a potent, long-acting inhibitor of opiate binding sites. Life Sci. 31: 1385-1388, 1982.

60. NISHIMURA S and PASTERNAK GW. Opiate and opioid peptide binding in rat and goldfish: further evidence for opiate receptor heterogeneity. Brain Res., 248: 192195, 1982.

61. PASTERNAK GW and CHILDERS SR. Opiate and opioid peptide actions in the central nervous system. In Recent Advances in Clinical Pharmacology (P. Turner and D.G. Shand, Eds.), Churchill-Livingston Press, p. 253-279.

62. SPIEGEL K, KOURIDES IA and PASTERNAK GW. Different receptors mediate morphine-induced prolactin and growth hormone release. Life Sci. 31:217-2180, 1982.

63. LING GSF and PASTERNAK GW. Morphine catalepsy in the rat: involvement or mu (high affinity) opioid binding sites. Neurosci. Letters. 32:193-196, 1982.

64. BURKHARDT C, FREDERICKSON RC and PASTERNAK GW. Metkephamid (Tyr-D-ala-gly-phe-N(Me)MetONH$_2$, a potent opioid peptide: receptor binding and analgesic properties. Peptides. 3:869-871, 1982.

65. PASTERNAK GW. Psychotropic drugs and chronic pain. In Diagnosis and Treatment of Chronic Pain (N. Hendler, D. Long and T. Wise, Eds.) Wright PSG Press. pp 201-210.

66. KIRCHGESSNER AL, BODNER RJ and PASTERNAK GW. Naloxazone and pain-inhibitory systems: evidence for a collateral inhibition model. Pharmacol. Biochem. Behav. 17:1175-1179, 1982.

67. SPIEGEL K, KALB P and PASTERNAK GW. Analgesic activity of tricyclic antidepressants. Annals Neurol. 13:462-465, 1983.

68. LING GSF, SPIEGEL K, NISHIMURA S and PASTERNAK GW. Dissociation of morphine's analgesic and respiratory depressant actions. Eur. J. Pharmacol. 86:487-488, 1983.

69. PASTERNAK GW. New approaches to chronic pain. Drug Therapy, May, 1983. p. 128.

70. WOOD PL and PASTERNAK GW. Specific mu$_2$ opioid isoreceptor regulation of nigrostriatal neurons: in vivo

evidence with naloxonazine. Neurosci. Lett. 37:291-293, 1983.

71. LING GSF and PASTERNAK GW. Spinal and supraspinal analgesiain the mouse: the role of subpopulations of opioid binding sites. Brain Res.,271:152-156, 1983.

72. HOLADAY JW, PASTERNAK GW, D'AMATO RJ, RUVIO BA and FADEN AI. Naloxazone lacks therapeutic effects in endotoxic shock yet blocks the effects of naloxone.Eur. J. Pharmacol. 89:293-296, 1983.

73. JOHNSON N and PASTERNAK GW. The binding to rat brain homogenates of Mr2034; A universal opiate. Life Sci. 33:985-991, 1983.

74. GINTZLER AR and PASTERNAK GW. Multiple mu receptors: evidence for mu_2 sites in the guinea pig ileum. Neurosci. Lett. 39:51-56, 1983.

75. PASTERNAK GW, GINTZLER AR, HOUGHTEN RA, LING GSF, GOODMAN RR, SPIEGEL K, NISHIMURA S, JOHNSON N and RECHT LD. Biochemical and pharmacological evidence for opioid receptor multiplicity in the central nervous system. Life Sci. Suppl. I. 33:167-173, 1983.

76. GOODMAN RR, HOUGHTEN RA, PASTERNAK GW. Autoradiography of ^{3}H-B-endorphin binding in brain. Brain Res. 288:334-337, 1983.

77. HOLADAY JW, PASTERNAK GW and FADEN AI. Naloxazone pretreatment modifies cardiorespiratory, temperature, and behavioral effects of morphine. Neurosci. Lett. 37:199204, 1983.

78. HAHN EF and PASTERNAK GW. Stereochemistry of opiates and their receptors. In Handbook of Stereoisomers (D. Smith, Ed.), CRC Press. Boca Raton, Florida. pp. 441-468, 1984.

79. NISHIMURA SL, RECHT LD and PASTERNAK GW. Biochemical characterizaton of high affinity ^{3}H-opioid binding: further evidence for mu_2 sites. Mol. Pharmacol. 25:29-37, 1984.

80. GOODMAN RR and PASTERNAK GW. Multiple opiate receptors. In Analgesics: Pharmacological and Clinical Perspectives (M.J. Kuhar and G.W. Pasternak, Eds.), Raven Press, New York. pp 6996,1984.

81. PASTERNAK GW and CHILDERS SR. Opiates, Opioid peptides and their receptors. In Critical Care: State of the Art (W.C. Shoemaker, ed) Society for Critical Care Medicine, Fullerton, CA, Vol. 5.Chapter F pp 1-60, 1984.

82. LING GSF, GALETTA S and PASTERNAK GW. Oxymorphazone: a long-acting opiate analgesic. Cell. Molec. Neurobiol. 4:1-13, 1984.

83. SPIEGEL K and PASTERNAK GW. Meptazinol: a novel mu_1 selective opioid analgesic. J. Pharmacol Exp.Ther. 228: 414-419, 1984.

84. JOHNSON N, ITZHAK Y and PASTERNAK GW. Interaction of two phencyclidine opiatelike derivatives with ^{3}H-opioid binding sites. Eur. J. Pharmacol. 101:281-284, 1984.

85. JOHNSON N, and PASTERNAK GW. Binding of ^{3}H-Naloxonazine to rat brain membranes. Mol. Pharmacol. 26:477-483, 1984

86. LING GSF, MACLEOD JM, LEE S, LOCKHART SH and PASTERNAK GW. Separation of morphine analgesia from physical dependence. Science 226:462-464, 1984

87. HOUGHTEN RA, JOHNSON N and PASTERNAK GW. ^{3}H-β-Endorphin binding in rat brain. J. Neurosci. 4:2460-2465, 1984

88. LING GSF, SPIEGEL K, LOCKHART SH and PASTERNAK GW. Separation of opioid analgesia from respiratory depression: evidence for different receptor mechanisms. J. Pharmacol Exp. Ther. 232:149-155, 1985

89. SIMONE, DA, BODNAR, RJ, GOLDMAN, EJ and PASTERNAK, G.W. Involvement of opioid receptor subtypes in rat feeding behavior. Life Sci. 36:829-833, 1985.

90. PASTERNAK GW. Pain and endogenous opioid systems inthe brain. In New Developments in Pain Research and Treatment. (S.J. Levitan and H.L. Berkowitz, eds) American Psychiatric Press, Inc., Washington, D.C. pp. 111-116, 1985.

91. YOBURN BC, GOODMAN RR, COHEN AH, PASTERNAK GW and INTURRISI CE. Increased analgesic potency of morphine and increased brain opioid binding sites in the rat following chronic naltrexone treatment. Life Sci. 36:2325-2332, 1985.

92. PASTERNAK GW, ADLER BA and RODRIGUEZ J. Characterization of the opioid receptor binding and animal pharmacology of meptazinol. Postgraduate Medical Journal 61(S):5-12, 1985.

93. RECHT LD, KENT J and PASTERNAK GW. Quantitative autoradiography of the development of mu opiate binding sites in rat brain. Cell. Molec. Neurobiol. 5:223229, 1985.

94. PASTERNAK GW. Endogenous opioid systems and the modulation of pain. Bulletin of the American Chinese Medical Society. September 1984, pp 7-9.

95. GOODMAN, RR and PASTERNAK, G.W. Visualization of mu opiate receptors in rat brainby using a computerized autoradiographic subtraction technique. Proc. Nat. Acad. Sci. USA. 82: 6667-6671, 1985.

96. GOODMAN RR, ADLER BA and PASTERNAK GW. Regional differences in mu binding of ^{3}H-DADL-enkephalin: Comparisons of thalamus and cortexin the rat. Neurosci Lett. 59:155-158, 1985

97. HAHN EF, NISHIMURA S, GOODMAN RR and PASTERNAK GW. Irreversible opiate agonists and antagonists: II. Evidence against a bivalent mechanism of action for opiate azines and diacylhydrazones. J. Pharmacol. Exp. Ther. 235:839-845, 1985.

98. HAHN EF, ITZHAK Y, NISHIMURA S, JOHNSON N and PASTERNAK GW. Irreversible opiate agonists and antagonist: III. Phenylhydrazone derivatives of naloxone and oxymorphone. J. Pharmacol. Exp. Ther. 235:846-850, 1985.

99. PASTERNAK GW. Multiple mu opiate receptors: biochemical and pharmacological evidence for multiplicity. Biochem. Pharmacol. 35: 361-364, 1986.

100. MOULIN DE and PASTERNAK GW. Neuropharmacology of pain In Diseases of the Nervous System (AK Asbury, GM McKhann, WI McDonald, eds) Ardmore Medical Books, Philadelphia, 1986, pp. 950-960.

101. PASTERNAK GW and WOOD PJ: Multiple mu opiate receptors. Life Sci 38: 18891898, 1986.

102. PASTERNAK GW. The biochemistry and pharmacology of multiple mu opioid receptors in Opioid Analgesics in the Management of Clinical Pain (K. Foley and C. Inturrisi, eds), RavenPress, N.Y., N.Y., pp. 337-344, 1986.

103. PASTERNAK, G.W. Multiple morphine and enkephalin receptors: biochemical and pharmacological aspects. In Stress-Induced Analgesia (D. Kelly, ed) New York Academy of Sciences, pp. 130-139, 1986.

104. ITZHAK Y and PASTERNAK GW. Kappa opiate binding to rat brain and guinea pig cerebellum: sensitivity towards ions and nucleotides. Neurosci. Lett. 64:81-84, 1986.

105. PASTERNAK GW. Multiple mu opioid receptors in the central nervous systemIn Handbook of Comparative Aspects of Opioid and Related Neuropeptide Mechanisms (G. Stefano, ed) CRC Press, Inc, Boca Raton, Florida, 1986, pp. 25-30.

106. SIMONE DA, BODNAR RJ, PORTZLINE T and PASTERNAK GW: Antagonism of morphine analgesia by intracerebroventricularnaloxonazine. Pharmacol. Biochem. Behavior, 24: 1721-1727, 1986.

107. LING GSF, SIMANTOV R, CLARK JA, and PASTERNAK GW: Naloxonazine actions in vivo. Eur. J. Pharmacol. 129:33-38, 1986.

108. CLARK JA, ITZHAK Y, HRUBY VJ, YAMAMURA HI, AND PASTERNAK GW: [D-Pen^2,D-Pen^5]Enkephalin (DPDPE): a delta-selective enkephalin with low affinity for μ opiate binding sites. Eur. J. Pharmacol. 128:303-304, 1986.

109. YOBURN BC, NUNES FA, ADLER BA, PASTERNAK GW, and INTURRISI CE: Pharmacodynamic supersensitivity and opioid receptor upregulation in the mouse. JPharmacol. Exp. Ther. 239:132-153, 1986.

110. ITZHAK Y and PASTERNAK GW: Interaction of [D-Ser^2,Leu^5]enkephalin-Thr^6 (DSLET), a relatively selective delta ligand, with mu$_1$ opioid binding sites. Life Sci. 40: 307-311, 1987.

111. FELDMANN E, BROMFIELD E, NAVIA B, PASTERNAK GW and POSNER JB: Hydrocephalic dementia and spinal cord tumors. Report of a case and review of literature. Archives of Neurol., 43: 714-718, 1986.

112. GALETTA S, HAHN EF, NISHIMURA S and PASTERNAK GW: Oxymorphone-naltrexonazine, a mixed opiate agonist-antagonist. Life Sci. 41:783-787, 1987.

113. PASTERNAK GW. Multiple opioid receptors. In Encyclopedia of Neuroscience (G. Adelman, ed) Birkhausen, Boston, pp. 887-888, 1987.

114. URBANCZYK-LIPKOWSKA Z, LIPKOWSKI AW, ETTER MC, HAHN EF, PASTERNAK GW, and PORTOGHESE PS: X-ray crystal structure of the opioid ligand naltrexonazine. J. Med. Chem., 30:14891494, 1987.

115. CALLAHAN P and PASTERNAK GW: Opiate Receptor Multiplicity: Evidence for multiple mu receptors.In Monographs in Neural Sciences: Vol. 13 Neurobiology of Drug Abuse (J. Marwah, ed) S. Karger Press, Basel, pp. 121-131, 1987.

116. PASTERNAK GW: Early Studies of Opiate Binding. inThe Opiate Receptors (GW Pasternak, ed), Humana Press Inc., Clifton, NJ, pp. 75-93, 1987.

117. GOODMAN RR, ADLER BA and PASTERNAK GW: Regional distribution of opiate receptors. inThe Opiate Receptors (GW Pasternak, ed), Humana Press Inc., Clifton, NJ, pp. 197-227, 1987.

118. PASTERNAK GW: Opiate and opioid peptide receptors: the past, the present and the future. inThe Opiate Receptors (GW Pasternak, ed), Humana Press Inc., Clifton, NJ, pp. 489495, 1987.

119. PASTERNAK GW. Opioid Receptors. In Psychopharmacology- The Third Generation of Progress (H.Y. Meltzer, ed), Raven Press, pp. 281-288, 1987.

120. RECHT L and PASTERNAK GW: Effects of β-funaltrexamine on radiolabeled opioid binding. Eur. J. Pharmacol. 140:209-214, 1987.

121. PASTERNAK GW, BODNAR RJ, CLARK JA and INTURRISI CE: Morphine-6-glucuronide, a potent mu agonist. Life Sci. 41: 2845-2849, 1987.

122. CALLAHAN P and PASTERNAK GW: Opiates, opioid peptides and their receptors. J. Cardiothoracic Anesthesia, 1:569-576, 1987.

123. PASTERNAK GW: Multiple morphine and enkephalin receptors and the relief of pain. J. Amer. Med. Assoc., 259:1362-1367, 1988.

124. MANN PE, ARJUNE D, ROMERO MT, PASTERNAK GW, HAHN EF, and BODNAR RJ: Differential sensitivity of opioid-induced feeding to naloxone and naloxonazine. Psychopharmacol. 94: 336-341, 1988.

125. MANN PE, PASTERNAK GW, HAHN EF, CURRERI G, LUBIN E, BODNAR RJ: Comparison of effects of chronic administration of naloxone and naloxonazine effects upon food intake and maintenance of body weight in rats. Neuropharmacol, 27:349-355, 1988.

126. CLARK JA and PASTERNAK GW: U50,488: a kappa-selective agent with poor affinity for mu opiate binding sites. Neuropharmacol., 27:331-332, 1988.

127. WILLIAMS CL, BODNAR RJ, CLARK JE, HAHN EF, BURKS TF and PASTERNAK GW: Irreversible opiate agonists and antagonists: IV. Analgesic actions of 14-hydroxydihydromorphinone hydrazones. J. Pharmacol. Exp. Ther., 245:8-12, 1988.

128. BODNAR RJ, WILLIAMS CW, LEE SJ and PASTERNAK GW: Role of mu opiate receptors in supraspinal opiate analgesia: a microinjection study. Brain Res. 447:25-34, 1988.

129. MOULIN DE, LING GSF and PASTERNAK GW: Unidirectional analgesic cross tolerance between morphine and levorphanol in the rat. Pain 33: 233-239, 1988.

130. PAUL D and PASTERNAK GW: Differential blockade by naloxonazine of two μ opiate actions: analgesia and inhibition of gastrointestinal transit. Eur. J. Pharmacol. 149:403-404, 1988.

131. PASTERNAK GW: Multiple mu opiate receptors. ISI Atlas of Science, 2:148-154, 1988.

132. LUKE MC, HAHN EF, PRICE M and PASTERNAK GW: Irreversible opiate agonists and antagonists: V. Hydrazone and acylhydrazone derivatives of naltrexone. Life Sci., 43:1249-1256, 1988.

133. PASTERNAK GW, CHILDERS SR: Opiates, opioid peptides and their receptors in The Textbook of Critical Care (W.L. Thompson, ed). Saunders, pp.1212-1229, 1989.

134. YOBURN BC, LUKE MC, PASTERNAK GW, and INTURRISI CE: Upregulation of opioid receptor subtypes correlates with potency changes of morphine and DADLE. Life Sci. 43:1319-1324, 1988.

135. BODNAR RJ, CLARK JA, COOPER ML, and PASTERNAK GW: Loss of striatal mu opiate binding by substantia nigra lesions in the rat. Life Sci. 43:1697-1700, 1988.

136. CLARK JA, HOUGHTEN R, PASTERNAK GW: Opiate binding in calf thalamic membranes: a selective mu binding assay. Mol. Pharmacol. 34:308-317, 1988.

137. ADLER BA, GOODMAN RR and PASTERNAK GW: Quantitative autoradiographic distribution of meptazinol sensitive binding sites in rat brain. Cell. and Mol. Neurobiol. 8:471-476, 1988.

138. PRICE M, GISTRAK MA, ITZHAK Y, HAHN EF, and PASTERNAK GW: Receptor binding of ^{3}H-naloxone benzoylhydrazone: a reversible kappa and slowly dissociable mu opiate. Mol. Pharmacol. 35: 674, 1989.

139. PASTERNAK GW: Studies of multiple morphine and enkephalin receptors: evidence for mu receptors. In

Receptor Mechanisms of Neurotransmitters and Neuropeptides (S. Kito, T. Segawa, K. Kuriyama, M. Tohyama, and R. Olsen, eds) Plenum Press, New York, pp. 81-93, 1988.

140. LING GSF, PAUL D, SIMANTOV R and PASTERNAK GW: Differentialdevelopment of acute tolerance to analgesia, respiratory depression, gastrointestinal transit and hormone release in a morphine infusion model. Life Sci. 45: 1627-1636, 1989.

141. PAUL D, BODNAR RJ, GISTRAK MA, and PASTERNAK GW: Different μ receptor subtypesmediate spinal and supraspinal analgesia in mice. Eur. J. Pharmacol. 168: 307-314, 1989.

142. CLARK JA, LIU L, PRICE M, HERSH B, EDELSON M and PASTERNAK GW: Kappa receptor multiplicity: evidence for two U50,488-sensitive κ_1 subtypes and a novel κ_3 subtype. J. Pharmacol. Exp. Ther. 251:461-468, 1989.

143. GISTRAK MA, PAUL D, HAHN EF and PASTERNAK GW: Pharmacological actions of a novel mixed opiate agonist/antagonist: naloxone benzoylhydrazone. J. Pharmacol. Exp. Ther. 251:469-476, 1989.

144. PAUL D, STANDIFER KM, INTURRISI CE and PASTERNAK GW: Pharmacological characterization of morphine-6β-glucuronide, a very potent morphine metabolite. J. Pharmacol. Exp. Ther. 251:477-483, 1989.

145. PASTERNAK GW: Radioligand Binding. In Modern Methods of Pharmacology (Vol. 6): Testing and Evaluation of Drugs of Abuse. (MW Adler and A Cowan, eds). Wiley-Liss, Inc, New York, pp. 1-17, 1990.

146. BODNAR RJ, PASTERNAK GW, MANN PE, PAUL D, WARREN R and DONNER DB: Mediation of anorexia by human recombinant tumor necrosis factor through a peripheral action in the rat. Cancer Res. 49: 6280-6284, 1989.

147. MANN PE, PASTERNAK GW and BRIDGES RS: Mu_1 opioid receptor involvement in maternal behavior. Physiology and Behavior 47: 133-138, 1990.

148. BODNAR RJ, PAUL D and PASTERNAK GW: Proglumide selectively potentiates supraspinal μ_1 analgesia in mice. Neuropharmacol. 29: 507-510, 1990.

149. KINOUCHI K, STANDIFER KM and PASTERNAK GW: Modulation of μ_1, μ_2 and δ opioid binding by divalent cations. Biochem. Pharmacol. 40:382-384, 1990.

150. BODNAR RJ, PAUL D, ROSENBLUM M, LIU L and PASTERNAK GW: Blockade of morphine analgesia by both pertussis and cholera toxins in the periaqueductal gray and locus coeruleus. Brain Res. 529: 324-328, 1990.

151. PAUL D, LEVISON JA, HOWARD DH, PICK CG, HAHN EF and PASTERNAK GW: Naloxone Benzoylhydrazone (NalBzdH) analgesia. J. Pharmacol. Exp. Ther. 255: 769-774, 1990.

152. ARJUNE D, STANDIFER KM, PASTERNAK GW and BODNAR RJ: Reduction by central β-funaltrexamine of food intake in rats under freely-feeding, deprivation and glucoprivic conditions. Brain Res. 535: 101-109, 1990.

153. GISTRAK MA and PASTERNAK GW: Opiate receptor solubilization and purification. inOpioid Peptides, Vol. IV (K. Ramabadron and J.J. Szekely, eds). CRC Press, Boca Raton, pp. 325, 1990.

154. STANDIFER KM, MURTHY L, KINOUCHI K, STEELE L and PASTERNAK GW: Affinity labeling mu and kappa receptors with naloxone benzoylhydrazone. Mol. Pharmacol. 39:290-298, 1991.

155. PICK CG, PAUL D and PASTERNAK GW: Comparison of naloxonazine and β-funaltrexamine antagonism of μ_1 and μ_2 opioid actions. Life Sci. 48:2005-2011, 1991.

156. PAUL D, PICK CG, TIVE LA and PASTERNAK GW: Pharmacological characterization of nalorphine, a κ analgesic. J. Pharmacol. Exp. Ther. 257:1-7, 1991.

157. STANDIFER KM and PASTERNAK GW: Multiple Opioid Receptor Subtypes. In Biochemistry and Physiology of Substance Abuse Vol. III (RR Watson, ed). CRC Press, Boca Raton, FL, pp. 379392, 1990.

158. KINOUCHI K and PASTERNAK GW: Evidence for κ_1 opioid receptor multiplicity in the guinea pig cerebellum. Eur. J. Pharmacol. 207: 135-141, 1991.

159. BODNAR RJ, PAUL D and PASTERNAK GW: Synergistic analgesic interactions between the periaqueductal gray and the locus coeruleus. Brain Res. 558:224230, 1991.

160. ADLER B, GOODMAN RR, and PASTERNAK GW: Opioid Peptide Receptors. In Handbook of Chemical Neuroanatomy: Neuropeptides in the CNS Part II (A Bjorklund, T Hokfelt and M Kuhar, eds) Elsevier Science Publishers B.V., Amsterdam, pp. 359-393, 1990.

161. PAYNE R and PASTERNAK GW: Pharmacology of Pain Treatment. Iin Contemporary Neurology Series: Scientific Basis of Neurologic Drug Therapy (MV Johnston, R MacDonald, AB Young, eds). F.A. Davis, Philadelphia, pp. 268-301, 1992.

162. KINOUCHI K, BROWN G, PASTERNAK G and DONNER DB: Identification and characterization of receptors for tumor necrosis factor-α in the brain. Biochem. Biophys. Res. Commun. 181: 1532-1538, 1991.

163. PICK CG, CHENG J, PAUL D and PASTERNAK GW: Genetic influences in opioid analgesic sensitivity in mice. Brain Res. 566: 295-298, 1991.

164. PICK CG, PAUL D, EISON MS and PASTERNAK GW: Potentiation of opioid analgesia by the antidepressant nefazadone. Eur. J. Pharmacol. 211:375-381, 1992.

165. KEPLER KL, STANDIFER KM, PAUL D, KEST B, PASTERNAK GW and BODNAR RJ: Gender effects and central opioid analgesia. Pain 45:87-94, 1991.

166. GALER BS, COYLE N, PASTERNAK GW and PORTENOY RK: Individual variability in the response to different opioids: report of five cases. Pain 49:8791, 1992.

167. FROIMOWITZ M, PICK CG and PASTERNAK GW: Phenylmorphans and analogs: opioid receptor subtype selectivity and effect of conformation on activity. J. Med. Chem. 35:1521-1525, 1992.

168. TIVE LA, PICK CG, PAUL D, ROQUES BP, GACEL GA and PASTERNAK GW: Analgesic potency of TRIMU-5: a mixed μ_2 opioid receptor agonist/μ_1 opioid receptor antagonist. Eur. J. Pharmacol. 216: 249-255, 1992.

169. PICK CG, PAUL D and PASTERNAK GW: Nalbuphine, a mixed kappa$_1$ and kappa$_3$ analgesic in mice. J. Pharmacol. Exp. Ther. 262: 1044-1050, 1992.

170. CHENG J, ROQUES BP, GACEL GA, HUANG E and PASTERNAK GW: Kappa$_3$ opiate receptor binding in the mouse and rat. Eur. J. Pharmacol. Mol. Pharmacol Sect. 226:15-20, 1992.

171. PICK CG, ROQUES G, GACEL G and PASTERNAK GW: Supraspinal μ_2 receptors mediate spinal/supraspinal morphine synergy. Eur. J. Pharmacol. 220:275-277, 1992.

172. KOLESNIKOV YA, PICK CG and PASTERNAK GW: N^G-nitro-L-arginine prevents morphine tolerance. Eur. J. Pharmacol. 221:399-400, 1992.

173. TIVE L, GINSBERG K, PICK CG and PASTERNAK GW: Kappa$_3$ receptors and levorphanol-induced analgesia. Neuropharmacol. 31:851-856, 1992.

174. PAYNE R and PASTERNAK GW: Pain and pain management in the elderly. In Geriatric Medicine (CK Cassel, J.R. Walsh, L. Sorensen and D. Reisenberg, eds). Springer-Verlag, New York, pp. 585-606, 1990.

175. PASTERNAK GW: Pharmacological mechanisms of opioid analgesics. Clin. Neuropharmacol. 16:1-18, 1993.

176. PICK CG, NEJAT RJ and PASTERNAK GW: Independent expression of two pharmacologically distinct supraspinal mu analgesic systems in genetically different mouse strains. J. Pharmacol. Exp. Ther. 265: 1666-71, 1993.

177. KOLESNIKOV YA, PICK CG and PASTERNAK GW: Blockade of tolerance to morphine but not kappa opioids by a nitric oxide synthase inhibitor. Proc. Nat. Acad. Sci. USA, 90:5162-5166, 1993.

178. STANDIFER KM, CLARK JA and PASTERNAK GW: Modulation of μ_1 opioid binding by magnesium: evidence for multiple receptor conformations. J. Pharmacol. Exp. Ther. 266: 1061-13, 1993.

179. PASTERNAK GW: Progress in Opiate Pharmacology. In Current and Emerging Issues in Cancer Pain: Research and Practice. (CR Chapman and KM Foley, eds) Raven Press, Ltd, New York, pp. 113-127, 1993.

180. KOLESNIKOV YA, FERKANY J and PASTERNAK GW: Blockade of mu and kappa$_1$ opioid analgesic tolerance by NPC17742, a novel NMDA antagonist. Life Sci. 53: 1489-1494, 1993.

181. NEGUS SS, HENRIKSEN SJ, MATTOX SR, PASTERNAK GW, PORTOGHESE PS, TAKEMORI AE, WEINGER MB, KOOB GF: Effect of antagonists selective for mu, delta and kappa opioid receptors on the reinforcing effects of heroin in rats. J. Pharmacol. Exp. Ther265: 1245-1252, 1993.

182. NEGUS SS, PASTERNAK GW, KOOB GF, WEINGER MB: Antagonist effects of betafunaltrexamine and naloxonazine on alfentanil-induced antinociception and muscle rigidity in the rat. J. Pharmacol. Exp. Ther. 264:739-745, 1993.

183. ROSSI GC, PASTERNAK GW and BODNAR RJ: Synergistic brainstem interactions for morphine analgesia. Brain Res. 624: 171-180, 1993.

184. KOCH JE, PASTERNAK GW, ARJUNE D and BODNAR RJ: Naloxone benzoylhydrazone, a kappa$_2$ opioid agonist, stimulates food intake in rats. Brain Res. 581: 311-314, 1992.

185. ELLIOT K, MINAMI N, KOLESNIKOV Y, PASTERNAK GW and INTURRISI CE: The NMDA receptor antagonists, LY274614 and MK-801, and the nitric oxide synthase inhibitor, N_G-nitro-L-arginine, attenuate analgesic tolerance to the mu-opioid morphine but not to kappa opioids. Pain 56: 69-75, 1994.

186. LIU L, KATZ Y, WEIZMAN R, ROSENBERG B, PASTERNAK GW and GAVISH M: Interactions of chloroquine with benzodiazepine, GABA and opiate receptors. Biochem. Pharmacol. 41: 1534-1536, 1990.

187. CHIEN CC and PASTERNAK GW: Functional antagonism of morphine analgesia by (+)pentazocine: evidence for an anti-opioid sigma$_1$ system. Eur. J. Pharmacol. 250: R7-8, 1993.

188. TISEO PJ, CHENG J, PASTERNAK GW, INTURRISI CE: Modulation of morphine tolerance by the competitive NMDA receptor antagonist LY274614: Assessment of opioid receptor changes. J. Pharmacol. Exp. Ther. 268: 195-201, 1994.

189. PASTERNAK GW: Basic pharmacology of Opioids. in The Pharmacological Basis of Anesthesiology: Basic Science and Clinical Applications (T.A. Bowdle, A. Horita and E.D. Kharasch, eds). Churchill Livingstone, Inc.

New York, pp. 19-36, 1994.

190. UHL GR, CHILDERS SR and PASTERNAK GW: An opiate receptor gene family reunion. Trends in Neurosci. 17:89-93, 1994.

191. ROSSI G, PAN Y.-X., CHENG J and PASTERNAK GW: Blockade of morphine analgesia by an antisense oligodeoxynucleotide against the mu receptor. Life Sciences, PL, 54: PL375-379, 1994.

192. BROOKS AI, STANDIFER KM, CHENG J, CISZEWSKA G and PASTERNAK GW: Opioid binding in giant toad and goldfish brain. Receptor 4:55-62, 1994.

193. CHIEN C.-C., BROWN G, PAN Y.-X. and PASTERNAK GW: Blockade of U50,488H analgesia by antisense oligodeoxynucleotides to a κ opioid receptor. Eur. J. Pharmacol. 253:R7-8, 1994.

194. STANDIFER KM, CHIEN C.-C., WAHLESTEDT C, BROWN GP and PASTERNAK GW: Selective loss of delta opioid analgesia and binding by antisense oligodeoxynucleotides to a delta opioid receptor. Neuron 12: 805-810, 1994.

195. KATZ Y, WEIZMAN A, PICK CG, PASTERNAK GW, LIU L, FONIA O and GAVISH M: Interactions between laudanosine, GABA and opioid subtype receptors: implication for laudanosine seizure activity. Brain Res. 646: 235-241, 1994.

196. BILSKY EF, BERNSTEIN N, PASTERNAK GW, HRUBY VJ, PATEL D, PORRECA F and LAI J: Selective inhibition of [D-Ala^2,Glu^4]deltorphin antinociception by supraspinal, but not spinal, administration of an antisense oligodeoxynucleotide to an opioid deltareceptor. Life Sci. 55:PL37-43, 1994.

197. KOLESNIKOV YA, MACCECHINI ML and PASTERNAK GW: 1-aminocyclopropane carboxylic acid (ACPC) prevents mu and delta opioid tolerance. Life. Sci. 55:1393-1398, 1994.

198. STANDIFER KM, CHENG J, BROOKS AI, HONRADO CP, SU W, VISCONTI LM, BEIDLER JL and PASTERNAK GW: Biochemical and pharmacological characterization of mu, delta and kappa opioid receptors expressed in BE(2)-C neuroblastoma cells. J. Pharmacol. Exp. Ther. .270: 1246-1255, 1994.

199. ROSSI GC, PASTERNAK GW and BODNAR RJ: Mu and delta opioid synergy between the periaqueductal gray and the rostro-ventral medulla. Brain Res. 665: 85-93, 1994.

200. LIPKOWSKI AW, PASTERNAK GW, MISTEREK K, GUMULKA SW, PACHOCKA M: Synthesis and biological properties of new naltrexone-peptide hybrids. Regulatory Peptides S127-128, 1994.

201. BABEY AM, KOLESNIKOV Y, CHENG J, INTURRISI CE, TRIFILLETTI RR and PASTERNAK GW: Nitric oxide and opioid tolerance. Neuropharmacol. 33:1463-1470, 1994.

202. PASTERNAK GW: Anti-opioid activity of sigma systems. Regulatory Peptides 54:219-220, 1994.

203. PAN, YX, CHENG, J, XU, J, PASTERNAK, GW: Cloning, Expression and Classification of a Kappa-Related Opioid Receptor Using Antisense Oligodeoxynucleotides, Regulatory Peptides 54:217-218, 1994.

204. CHIEN CC and PASTERNAK GW: Selective antagonism of opioid analgesia by a sigma system. J. Pharmacol. Exp. Ther. 271: 1583-1590, 1994.

205. VISCONTI LM, STANDIFER KM, SCHILLER PW and PASTERNAK GW: TIPP[Ψ], a highly selective delta ligand. Neurosci. Lett. 181: 47-49, 1994.

206. DOOLEY CT, CHUNG NN, WILKES BC, SCHILLER PW, BIDLACK JM, PASTERNAK GW and

HOUGHTEN RA: An all D-amino acid opioid peptide with central analgesicactivity from a combinatorial library. Science 266:2019-2022, 1994.

207. LAI, J., BILSKY, E.J., BERNSTEIN, R.N., ROTHMAN, R.B., PASTERNAK, G.W., and PORRECA, F: Antisense oligodeoxynucleotide to the cloned delta opioid receptor selectively inhibits supraspinal, but not spinal, antinociceptive effects of [D-Ala^2, Glu^4]deltorphin. Regul. Pept. 54:159-160, 1994.

208. PASTERNAK GW and INTURRISI CE: Pharmacological modulation of opioid tolerance. Exp. Opin. Invest. Drugs 4: 271-281, 1995

209. PAN YX, CHENG J, XU J, ROSSI G, JACOBSON E, RYAN-MORO J, BROOKS AI, DEAN GE, STANDIFER KM, and PASTERNAK GW: Cloning and functional characterizationthrough antisense mappingof a kappa$_3$-related opioid receptor. Mol. Pharmacol. 47: 11801188, 1995

210. PASTERNAK GW: Nitric oxide and opioid tolerance. NIDA Research Monograph (NIH Pub. No. 953887) 147: 182-194, 1995.

211. COLE JL, LEVENTHAL L, PASTERNAK GW, BOWEN WD and BODNAR RJ: Reductions in body weight following chronic central opioid receptor subtype antagonists during development of dietary obesity in rats. Brain Res. 678: 168-176, 1995.

212. BERZETEI-GURSKE IP, WHITE A, POLGAR W, DECOSTA BR, PASTERNAK GW and TOLL L: The in vitro pharmacological characterization of naloxone benzoylhydrazone.Eur. J. Pharmacol. 277: 257-263, 1995

213. PASTERNAK GW, PAN YX and CHENG J: Correlating the pharmacology and molecular biology of opioid receptors: cloning and antisense mapping of a kappa$_3$ related opiate receptor.In Functional Diversity of Interacting Receptors (A. Lajtha and L. Abood, eds.) New York Academy of Sciences, New York, pp. 332-338, 1995.

214. BODNAR RJ and PASTERNAK GW: Aging and Analgesic Mechanisms In Neuroregulatory Mechanisms in Aging (M. Makman and G. Stefano, eds.). Pergamon Press Ltd., pp. 137-157, 1993.

215. CHIEN C-C and PASTERNAK GW: Sigma antagonists potentiate opioid analgesia in rats. Neurosci. Lett. 190:137-139, 1995.

216. CHENG J, STANDIFER KM, TUBLIN PR, SU W and PASTERNAK GW: Demonstration of kappa$_3$ opioid receptors in the SH-SY5Y human neuroblastoma cell line. J. Neurochem. 65: 170175, 1995.

217. ROSSI GR, PAN Y.-X., BROWN and PASTERNAK GW: Antisense mapping the MOR-1 opioid receptor: Evidence for alternative splicing and a novel morphine6β-gluronide receptor. FEBS Lett. 369: 192-196, 1995.

218. PASTERNAK GW and STANDIFER KM: Mapping of opioid receptors using antisense oligodeoxynucleotides: correlating their molecular biology and pharmacology. Trends in Pharmacol. Sci. 16: 344-350, 1995

219. ROSSI GC, STANDIFER KM, and PASTERNAK GW: Differential blockade of morphine and morphine6β-glucuronide analgesia by antisense oligodeoxynucleotides directed against MOR1 and G-protein α subunits in rats. Neuroscience Lett. 198:99-102, 1995.

220. PAUL D and PASTERNAK GW: Opioids and the control of pain In Neurotherapeutics: Emerging Strategies (L. Pullsn and J. Patel, eds), Humana Press, Totowa, NJ, pp. 167-192, 1995.

221. STANDIFER KM, JENAB S, SU W, CHIEN C.-C., PAN Y-X, INTURRISI CE and PASTERNAK GW: Antisense oligodeoxynucleotides to the cloned δ receptor DOR1: Uptake, stability, and regulation of gene expression. J. Neurochem. 65: 1981-1987, 1995.

222. CHIEN CC and PASTERNAK GW: (-)Pentazocine analgesia in mice: interactions with a σ receptor system.Eur. J. Pharmacol. 294: 303-308, 1995.

223. REISINE T and PASTERNAK GW: Opioid Analgesics and Antagonists in Goodman and Gilman's The Pharmacological Basis of Therapeutics (9th edition) (JG Hardman and LE Limbird, eds.) pp. 521-556, 1996.

224. ELLIOT KJ and PASTERNAK GW: Pain. In Conn's Current Therapy (RE Rakel, ed), W.B. Saunders Co., New York, NY, pp. 1-5, 1996

225. PASTERNAK GW, KOLESNIKOV YA and BABEY AM: Perspectives on the NMDA/NO cascade and opioid tolerance. Neuropsychopharmacology, 13: 309313, 1995.

226. KOLESNIKOV YA, JAIN S and PASTERNAK GW: Modulation of opioid analgesia by agmatine.Eur. J. Pharmacol. 296:17-22, 1996.

227. BROOKS AI, STANDIFER KM, ROSSI GC, MATHIS JP, and PASTERNAK GW: Characterizing κ opioid receptors with a selective monoclonal antibody. Synapse, 22:247-252, 1996

228. PAN Y-X, XU, J and PASTERNAK GW: Cloning and expression of a cDNA encoding a mouse brain orphanin FQ/nociceptin precursor. Biochem. J. 315: 11-13, 1996.

229. KHANOLKAR AD, YIN D, MAKRIYANNIS A, BROOKS AI, PASTERNAK GW and FROIMOWITZ M: The morphine-like and nonmorphine-like conformers of prodine opioids. Med. Chem. Res. 6:11-21, 1996

230. PAN Y.-X., XU J and PASTERNAK GW: Structure and characterization of the gene encoding a mouse kappa-related opioid receptor. Gene 171: 255-260, 1996.

231. PASTERNAK GW and STANDIFER KM: Orphan receptor or κ-opioid receptor?/Pasternak and Standifer reply (letter). Trends in Pharmacol. Sci. 17: 217-218, 1996.

232. STANDIFER KM, ROSSI GC and PASTERNAK GW: Differential blockade of opioid analgesia by antisense oligodeoxynucleotides directed against various G-protein α subunits. Mol. Pharmacol. 50:293-298, 1996.

233. ROSSI GC, BROWN GP, LEVENTHAL L, YANG K and PASTERNAK GW: Novel receptor mechanisms for heroin and morphine-6β-glucuronide analgesia. Neurosci. Lett. 216: 1-4, 1996.

234. CISZEWSKA GR, GINOS JA, CHARTON M, STANDIFER KM, BROOKS AI, BROWN GP, RYAN-MORO J, BERZETEI-GURSKE I, TOLL L and PASTERNAK GW: Synthesis and characterization of substituted benzoylhydrazones of naloxone. Synapse 24: 193-201, 1996.

235. ROSSI GC, LEVENTHAL L and PASTERNAK GW: Naloxone-sensitive orphanin FQ/nociceptin analgesia in mice. Eur. J. Pharmacol. 311: R7-R8, 1996.

236. KOLESNIKOV Y, JAIN S, WILSON R and PASTERNAK GW: Peripheral κ-opioid receptor-mediated analgesia in mice. Eur. J. Pharmacol. 310:141-143, 1996.

237. KOLESNIKOV YA, JAIN S, WILSON R and PASTERNAK GW: Peripheral morphine analgesia: Synergy with central sites and a target of morphine tolerance. J. Pharmacol. Exp. Ther. 279:502-506, 1996.

238. PAN YX, XU J, RYAN-MORO J, MATHIS J, HOM JSH, MEI J and PASTERNAK GW: Dissociation of affinity and efficacy in KOR-3 chimeras. FEBS Lett. 395:207-210, 1996.

239. RYAN-MORO J, CHIEN CC, STANDIFER KM and PASTERNAK GW: Sigma$_1$ binding in a human neuroblastoma cell line. Neurochem. Res., 21:1309-1314, 1996.

240. LEVENTHAL L, COLE JL, ROSSI GC, PAN YX, PASTERNAK GW and BODNAR RJ: Antisense oligodeoxynucleotides against the MOR-1 clone alter weight and ingestive responses in rats. Brain Res. 719:78-84, 1997.

241. MATHIS JP, RYAN-MORO J, CHANG A, HOM JS, SCHEINBERG DA and PASTERNAK GW: Biochemical evidence for orphanin FQ/nociceptin receptor heterogeneity in mouse brain. Biochem. Biophys. Res Comm. 230: 462-465, 1997.

242. ROSSI GC and PASTERNAK GW: Establishing the molecular biology of opioid behavior though antisense approaches. In Antisense Oligodeoxynucleotides and Antisense RNA: Novel Pharmacological and Therapeutic Agents, B. Weiss, ed., CRC Press, New York, pp. 115-130, 1997.

243. KING MA, ROSSI GC, CHANG AH, WILLIAMS L and PASTERNAK GW: Spinal analgesic activity of orphanin FQ/nociceptin and its fragments. Neurosci. Lett. 223:113-116, 1997.

244. CHIEN C-C, CARROLL FI, BROWN GP, PAN YX, BOWEN W AND PASTERNAK GW: Synthesis and characterization of [^{125}I]3'(-)-iodopentazocine, a selective σ receptor ligand, Eur. J. Pharmacol., 321:361-368, 1997.

245. KOLESNIKOV Y, JAIN S, WILSON R and PASTERNAK GW: Blockade of morphine-induced hindlimb myoclonic seizures in mice by ketamine. Pharmacol. Biochem. Behav. 56:423-425, 1997.

246. STANDIFER KM and PASTERNAK GW: G proteins and opioid receptor-mediated signaling. Cellular Signaling 9:237-248, 1997.

247. LEVENTHAL L, COLE JL, ROSSI GC, PAN YX, PASTERNAK GW and BODNAR RJ: Antisense oligodeoxynucleotides against the MOR-1 clone alter weight and ingestive responses in rats. Brain Res. 719:78-84, 1996.

248. ROSSI GC, SU W, LEVENTHAL L, SU H and PASTERNAK GW: Antisense mapping DOR-1 in mice: Further support for delta receptor subtypes. Brain Res., 753:176-179, 1997.

249. ROSSI GC, LEVENTHAL L, BOLAN E and PASTERNAK GW: Pharmacological characterization of orphanin FQ/nociceptin and its fragments. J. Pharmacol. Exp. Ther. 282: 858-865, 1997.

250. KOLESNIKOV YA, PAN Y-X, BABEY A-M, JAIN S, WILSON R and PASTERNAK GW: Functionally differentiating two nNOS isoforms through antisense mapping: Evidence for opposing NO actions on morphine analgesia and tolerance. Proc. Nat. Acad. Sci. USA 94:8220-8225, 1997.

251. BROWN GP, YANG K, KING MA, ROSSI GC, LEVENTHAL L, CHANG A and PASTERNAK GW: 3-Methoxynaltrexone, a selective heroin/morphine-6β-glucuronide antagonist. FEBS Letters 412:35-38, 1997.

252. BROWN GP, YANG K, OUERFELLI O, STANDIFER KM, BYRD D and PASTERNAK GW: ^{3}H-Morphine-6β-glucuronide binding in brain membranes and an MOR-1 transfected cell line. J. Pharmacol. Exp. Ther. 282:1291-1297, 1997.

253. 253. ROSSI GC, LEVENTHAL L, PAN YX, COLE J, SU W, BODNAR RJ and PASTERNAK GW: Antisense mapping of MOR-1 in rats: Distinguishing between morphine and morphine-6β-glucuronide antinociception. J. Pharmacol. Exp. Ther. 281: 109-114, 1997.

254. LEVENTHAL L, STEVENS LB, ROSSI GC, PASTERNAK GW and BODNAR RJ: Antisense mapping of the MOR-1 opioid receptor clone: Modulation of hyperphagia induced by DAMGO. J. Pharmacol. Exp. Ther. 282: 1402-1407, 1997.

255. KING M, PAN YX, MEI J, CHANG A, XU J and PASTERNAK GW: Enhanced kappa-opioid receptor-mediated analgesia by antisense targeting the sigma$_1$ receptor. Eur. J. Pharmacol. 331: R5-R6, 1997.

256. ROSSI GC, MATHIS JP and PASTERNAK GW: Analgesic activity of Orphanin FQ2, murine prepro-orphanin $FQ_{141-157}$, in mice. NeuroReport 9: 1165-1168, 1998.

257. KING M, CHANG A and PASTERNAK GW: Functional blockade of opioid analgesia by orphanin FQ/nociceptin. Biochem. Pharmacol 55: 1537-1540, 1998.

258. PAN YX, MEI J, XU J, WAN B-L, ZUCKERMAN A and PASTERNAK GW: Cloning and characterization of a mouse sigma$_1$ receptor. J. Neurochem. 70:2279-2285, 1998.

259. KOLESNIKOV Y, JAIN S, WILSON R and PASTERNAK GW: Lack of morphine and enkephalin tolerance in 129/SvEv mice: Evidence for a NMDA receptor defect. J. Pharmacol. Exp. Ther. 284:455-459, 1998.

260. ROSSI GC, PERLMUTTER M, LEVENTHAL L, TALATTI A and PASTERNAK GW: Orphanin FQ/nociceptin analgesia in the rat. Brain Res. 792:327-330, 1998.

261. CHARTON M, CISZEWSKA GR, GINOS J, STANDIFER KM, BROOKS AI, BROWN GP, RYAN-MORO JP and PASTERNAK GW: Quantitative structure activity relationships for substituted naloxone benzoylhydrazones: 4'-substituted naloxone benzoylhydrazones. Quantitative StructureActivity Relationships, 17:109-121, 1998.

262. MATHIS JP, GOLDBERG IE, ROSSI GC, LEVENTHAL L and PASTERNAK GW: Antinociceptive analogs of orphanin FQ/Nociceptin (1-11). Life Sciences/Pharmacology Lett. 63PL161-6, 1998.

263. PAYNE R and PASTERNAK GW: Pain, in Pharmacological Management of Neurological and Psychiatric Disorders (S.J. Enna and J.T. Coyle, eds) McGraw-Hill, New York, pp. 429-457, 1998.

264. BROWN GP and PASTERNAK GW: ^{3}H-Naloxone benzoylhydrazone binding in MOR-1-transfected CHO cells: Evidence for G-protein-dependent antagonist binding. J. Pharmacol. Exp. Ther. 286: 376-381, 1998.

265. LEVENTHAL L, MATHIS JP, ROSSI GC, PASTERNAK GW and BODNAR RJ: Orphan opioid receptor antisense probes block orphanin FQ-induced hyperphagia. Eur. J. Pharmacol. 349: R1-R3, 1998.

266. LEVENTHAL L, SILVA RM, ROSSI GC, PASTERNAK GW and BODNAR RJ: Morphine-6β-glucuronide-induced hyperphagia: Characterization of opioid action by selective antagonists and antisense mapping in rats. J. Pharmacol. Exp. Ther. 287: 538-544, 1998.

267. PAN Y-X, XU J, WAN B-L, ZUCKERMAN A and PASTERNAK GW: Identificationand differential regional expression of KOR-3/ORL-1 gene splice variants in mouse brain. FEBS Lett. 435: 6568, 1998.

268. CHANG A, EMMEL DW, ROSSI GC and PASTERNAK GW: Methadone analgesia in morphineinsensitive CXBK mice. Eur. J. Pharmacol. 351: 189-191, 1998.

269. KRZANOWSKA EK, ROSSI GC, PASTERNAK GW and BODNAR RJ, Potency ratios of morphine and morphine-6β-glucuronide analgesia elicited from the periaqueductal gray, locus coeruleus or rostral ventromedial medulla of rats. Brain Res. 799: 329-333, 1998.

270. PASTERNAK GW: The central questions in pain may be peripheral. Proc. Nat. Acad. Sci. USA 95: 10354 10355, 1998.

271. BURDICK K, YU W.-Z., RAGNAUTH A, MOROZ M, PAN Y.X., ROSSI GC, PASTERNAK GW and BODNAR RJ: Antisense mapping of opioid receptor clones: effects upon 2deoxy-D-glucose-induced

hyperphagia. Brain Res. 794:359-363, 1998.

272. GOLDBERG IE, ROSSI GC, LETCHWORTH SR, MATHIS JP, RYAN-MORO J, LEVENTHAL L, SU W, EMMEL D, BOLAN EA and PASTERNAK GW : Pharmacological characterization of endomorphin-1 and endomorphin-2 in mouse brain. J. Pharmacol. Exp. Ther. 286: 1007-1013, 1998.

273. SCHULLER AG, KING MA, ZHANG J, BOLAND E, CHANG A, CZICK ME, UNTERWALD, E, PASTERNAK GW and PINTAR JE: Retention of heroin and morphine-6B-glucuronide analgesia in a new line of mice lacking exon 1 of MOR-1. Nature Neurosci. 2: 151-156, 1999.

274. KOLESNIKOV YA and PASTERNAK GW: Peripheral orphanin FQ/nociceptin analgesia in the mouse. Life Sci. 64:2021-2028, 1999.

275. PASTERNAK GW: Genetics and opioid pharmacology. *In*: Handbook of Genetic Influences on the Nervous System (D.W. Pfaff, ed), CRC Press, Boca Raton, FL, pp. 1329, 1999.

276. PAN Y-X, XU J, BOLAN E, ABBADIE C, CHANG A, ZUCKERMAN A, ROSSI G and PASTERNAK GW: Identification and characterization of three new alternatively spliced mu opioid receptor isoforms. Mol. Pharmacol..56: 396-403, 1999.

277. PASTERNAK KR, ROSSI GC, ZUCKERMAN A and PASTERNAK GW: Antisense mapping KOR-1: Evidence for multiple kappa analgesic mechanisms. Brain Res. 826: 289292, 1999.

278. KOLESNIKOV YA and PASTERNAK GW: Topical opioid in mice: Analgesia and reversal of tolerance by a topical N-methyl-D-aspartate antagonist. J. Pharmacol. Exp. Ther. 290: 247-252, 1999.

279. KOLESNIKOV YA and PASTERNAK GW: Peripheral blockade of topical morphine tolerance by ketamine.Eur. J. Pharmacol. 374:R1-2, 1999.

280. PASTERNAK GW and LETCHWORTH SR: Future opioid analgesics: Targeting the old and the new. Curr. Opin. CPNS Invest. Drugs. 1: 54-64, 1999.

281. ZHU Y, KING MA, SCHULLER GP, NITSCHE JF, REIDL M, ELDE R, UNTERWALD E, PASTERNAK GW and PINTAR JE: Retention of supraspinal delta-like analgesia and loss of morphine tolerance in delta opioid receptor (DOR-1) knock-out mice. Neuron 24:243-252, 1999.

282. HOM JSH, GOLDBERG IE, MATHIS JP, PAN Y.-X., BROOKS AI, RYAN-MORO J, SCHEINBERG DA and PASTERNAK GW: [^{125}I]Orphanin FQ/nociceptin binding in Raji cells. Synapse 34:187-191, 1999.

283. WALKER JR, KING M, IZZO E, KOOB GF and PASTERNAK GW: Antagonism of heroin and morphine self administration in rats by the morphine-6β-glucuronide antagonist 3-0-methylnaltrexone. Eur. J. Pharmacol. 383:115-119, 1999.

284. PASTERNAK GW: Antisense mapping: Exploring the functional significance of alternative splicing. In *Antisense Technology in the CNS.* (R. Leslie, J. Hunter and H. Robertson, eds.) Oxford U. Press. Oxford, UK, pp. 98107, 1999.

285. ZUCKERMAN A, BOLAN E, de PAULIS T, SCHMIDT D, SPECTOR S and PASTERNAK GW: Pharmacological characterization of morphine-6-sulfate and codeine-6-sulfate. Brain Res. 842:1-5, 1999.

286. MATHIS JP, GOLDBERG IE, LETCHWORTH SR, RYAN-MORO J and PASTERNAK GW: Identification of a high affinity orphanin FQ/nociceptin(1-11) binding site in mouse brain. Synapse 34:181-6, 1999.

287. PASTERNAK GW: Modulation of Opioid Analgesia: Tolerance and Beyond. In Opioid Sensitivity of Chronic

Noncancer Pain, Progress in Pain Research and Management, Vol. 14; E. Kalso, HJ McQuay and Z. Weisenfeld Hallin, eds. IASP Press, Seattle, Vol 14, pp83-94, 1999.

288. PAN Y-X, XU J, BOLAN E, CHANG A, MAHURTER, L, ROSSI G and PASTERNAK GW: Isolation and expression of a novel alternatively spliced mu opioid receptor isoform, MOR1F. FEBS Lett. 466: 337-340, 2000.

289. ABBADIE C, PAN Y-X, PASTERNAK GW: Distribution in rat brain of a new mu opioid receptor splice variant MOR-1C: Evidence for region specific-specific processing. J. Comp. Neurol. 419: 244-256, 2000.

290. PASTERNAK GW: Opioids, in *Basic and Applied Science for Anesthesia*(H. Hemmings and P. Hopkins, eds), Mosby International, pp. 275-284, 2000.

291. LETCHWORTH SR, MATHIS JP, ROSSI GC, BODNAR RJ and PASTERNAK GW: Autoradiographic localization of ^{125}I[Tyr^{14}]orphanin FQ/nociceptin and ^{125}I[Tyr^{10}]orphanin FQ/nociceptin(1-11) binding sites in rat brain. J. Comp. Neurol. 423:319-329, 2000.

292. STEIN JA, ZNAMENSKY V, BAUMER F, ROSSI GC, PASTERNAK GW and BODNAR RJ: Mercaptoacetate induces feeding through central opioid-mediated mechanisms in rats. Brain Res. 864:240-51, 2000.

293. PASTERNAK GW: Molecular Biology of Mu Opioid Analgesia, in Proceedings of the 9th World Congress on Pain, Progress in Pain Research and Management, Vol. 17; M Devor, Mrowbotham and Z. Wiesenfeld-Hallin, eds. IASP Press, Seattle, 2000, pp. 147-162.

294. ABBADIE C, PAN Y-X, DRAKE CT, PASTERNAK GW: Comparative immunohistochemical distributions of carboxy terminus epitopes from the mu opioid receptor splice variants MOR-1D, MOR-1 and MOR-1C in the mouse and rat CNS. Neuroscience 100:141-53, 2000

295. KOLESNIKOV YA, CHERESHNEV I and PASTERNAK GW: Analgesic synergy between topical lidocaine and topical opioids. J. Pharmacol. Exp. Ther. 295:546-51, 2000.

296. SILVA RM, ROSSI GC, MATHIS JP, STANDIFER KM, PASTERNAK GW and BODNAR RJ: Morphine and morphine-6β-glucuronide-induced feeding are differentially reduced by Gprotein α-subunit antisense probes in rats. J. Pharmacol. Exp. Ther. 876:62-75, 2000

297. PASTERNAK GW and PAN Y.-X.: Antisense mapping: Assessing functional significance of genes and splice variants. In *Methods of Enzymology Vol. 314: Antisense Technology: Part B, Applications* (M.I. Phillips, ed). Academic Press, Orlando, FL. pp. 51-60, 2000.

298. PASTERNAK GW: Incomplete cross tolerance and multiple mu opioid peptide receptors. Trends in Pharmacological Sciences22:67-70, 2001.

299. MATHIS JP, MANDYAM CD, ALTEMEMI GF, PASTERNAK GW and STANDIFER KM: Orphanin FQ/nociceptin and naloxone benzoylhydrazone active distinct receptors in BE(2)C human neuroblastoma cells. Neurosci. Lett. 299:173-176, 2001.

300. KING MA, SU W, CHANG A, ZUCKERMAN A and PASTERNAK GW: Transport of opioids from the brain to the periphery by P-glycoprotein: peripheral actions of central drugs. Nature Neurosci. 4:268-274, 2001.

301. PASTERNAK GW: The pharmacology of mu analgesics: from patients to genes. The Neuroscientist 7:220-231, 2001.

302. ABBADIE C, GULTEKIN SH and PASTERNAK GW: Immunohistochemical localization of the carboxy terminus of the novel mu opioid receptor splice variant MOR1C within the human spinal cord. NeuroReport 11:1953-7, 2000.

303. SILVA RM, HADJIMARKOU MM, ROSSI GC, PASTERNAK GW and BODNAR RJ: β-Endorphin-induced feeing: pharmacological characterization using selective opioid antagonists and antisense probes. J. Pharmacol Exp. Ther. 297: 590-596, 2001.

304. CHERNY N, RIPAMONTI C, PEREIRA J, DAVIS C, FALLON M, McQUAY H, MERCADANTE S, PASTERNAK G and VENTAFRIDDA V: Strategies to manage the adverse effects of oral morphine: An evidence-based report. J. Clin. Oncol. 19: 2543-2554, 2001.

305. MEI J and PASTERNAK GW: Molecular cloning and pharmacological characterization of the rat sigma receptor. Biochem. Pharmacol. 62:349-355, 2001.

306. KING MA, BRADSHAW S, CHANG AH, PINTAR JE and PASTERNAK GW: Potentiation of opioid analgesia in dopamine$_2$ receptor knockout mice: Evidence for a tonically active anti-opioid system. J. Neurosci.21: 7788-7792, 2001.

307. ABBADIE C and PASTERNAK GW: Differential in vivo internalization of MOR1 and MOR-1C by morphine. Neuro. Report 12, 3069-3072, 2001.

308. PASTERNAK GW: Insights into mu opioid pharmacology: the role of mu opioid receptor subtypes. Life. Sci. 68:2213-2219, 2001.

309. MOGIL J and PASTERNAK GW: The molecular and behavioral pharmacology of the orphanin FQ/nociceptin peptide and receptor family. Pharmacol. Rev. 53:381-415, 2001.

310. SHANE R, LAZAR DA, ROSSI GC, PASTERNAK GW and BODNAR RJ: Analgesia elicited by OFQ/nociceptin and its fragments from the amygdala in rats. Brain Res. 907: 109116, 2001.

311. ABBADIE C, PASTERNAK GW and AICHER SA, Presynaptic bcalization of the carboxy terminus epitopes of the mu opioid splice variants MOR-1C and MOR-1D in the superficial laminae of the spinal cord. Neuroscience 106:833-842, 2001.

312. PAN Y, XU J, MAHURTER L, BOLAN E, XU M, PASTERNAK GW: Generation of the mu opioid receptor (MOR-1) protein by three new splice variants of the *Oprm* gene. Proc. Nat. Acad. Sci. USA 98:14084-14089, 2001.

313. MATHIS JP, ROSSI GC, PELLEGRINO MJ, JIMENEZ C, PASTERNAK GW and ALLEN RG: Carboxyl terminal peptides derived from preproorphanin FQ/nociceptin (ppOFQ/N) are produced in the hypothalamus and possess analgesic bioactivities. Brain Res. 895:8994, 2001.

314. NEILAN CL, NGUYEN TM, SCHILLER PW and PASTERNAK GW: Pharmacological characterization of the dermorphin analog [Dmt(1)]DALDA, a highly potent and selective mu-opioid peptide. Eur. J. Pharmacol. 419:15-23, 2001.

315. ROSSI GC, PELLEGRINO M, SHANE R, ABBADIE CA, DUSTMAN J, JIMENEZ, BODNAR RJ, PASTERNAK GW and ALLEN RG: Characterization of rat preproorphanin FQ/nociceptin$_{(154-181)}$: nociceptive processing in supraspinal sites. J. Pharmacol. Exp. Therap. 300: 257-64, 2002.

316. ABBADIE C and PASTERNAK GW: Endorphins and their receptors. In Encyclopedia of the Human Brain. (V.S. Ramachandran, ed.), Academic Press, San Diego, 2:193200, 2002.

317. PAN YX, BOLAN EA and PASTERNAK GW: Dimerization of morphine and orphanin FQ/nociceptin receptors: generation of a novel opioid receptor subtype. Biochem. BiophysRes. Comm. 297:659-63, 2002

318. SILVA RM, GROSSMAN HC, ROSSI GC, PASTERNAK GW and BODNAR RJ: Pharmacological characterization of β-endorphin- and dynorphin-A_{1-17}-induced feeding using G-protein α-subunit antisense probes in rats. Peptides, 23:1101-1106, 2002.

319. MEI J and PASTERNAK GW: Sigma$_1$ Receptor Modulation of Opioid Analgesia in the Mouse. J. Pharmacol. Exp. Ther. 300:1070-1074, 2002.

320. HADJIMARKOU MM, SILVA RM, ROSSI GC, PASTERNAK GW and BODNAR RJ: Feeding induced by food deprivation is differentially reduced by Gprotein α-subunit antisense probes in rats. Brain Res. 955: 4554, 2002.

321. NITSCHE JF, SCHULLER AG, KING MA, ZENGH M, PASTERNAK GW and PINTAR JE: Genetic Dissociation of Opiate Tolerance and Physical Dependence in Delta Opioid Receptor1 and Preproenkephalin Knockout Mice. J. Neurosci 22:10906-13, 2002.

322. HARRISON BA, GIERASCH TM, NEILAN C, PASTERNAK GW and VERDINE GL: High-affinity mu opioid receptor ligands discovered by the screening of an exhaustively stereodiversified library of 15-enediols. J. Am. Chem. Soc. 124:13352-3, 2002

323. BOLAN E, TALLARIDA RJ and PASTERNAK GW: Synergy between mu opioid ligands: Evidence for functional interactions among mu opioid receptor subtypes. J. Pharmacol. Exp. Ther303:557-62, 2002.

324. ABBADIE C, ROSSI GC, ORCIUOLO A, ZADINA JE and PASTERNAK GW: Anatomical and functional correlation of theendomorphins with opioid receptor splice variants. Eur. J. Neurosci.16:1075-82, 2002.

325. SILVA RM, GROSSMAN HC, HADJIMARKOU MM, ROSSI GC, PASTERNAK GW and BODNAR RJ: Dynorphin A_{1-17}-induced feeding: pharmacological characterization using selective opioidantagonists and antisense probes in rats. J. Pharmacol. Exp. Ther. 301:5138, 2002.

326. ABBADIE C and PASTERNAK GW: Opioid Receptors. In *Handbook of Chemical Neuroanatomy: Peptide Receptors Part II* (R. Querion, A. Bjorklund and T Hokfelt, Eds). Vol. 20: Peptide receptors, Part II, Elsevier Science, Amsterdam pp. 1-29, 2003.

327. KING MA, SU W, NEILAN CL, CHANG AH, SCHUTZ J, SCHMIDHAMMER H and PASTERNAK GW: 14-Methoxymetopon, a very potentμ-opioid receptor-selective analgesic with an unusual pharmacological pofile. Eur. J. Pharmacol. 459:203-209, 2003

328. PASTERNAK GW and KOLESNIKOV YA: The NMDA/Nitric Oxide Synthase cascade in opioid analgesia and tolerance. In *Glutamate and Addiction* (BH Herman, J Frankenheim, R Litten, PH Sheridan, FF Weight and SR Zukin, eds). Humana Press, Totowa, NJ, pp.409-416, 2003.

329. NEILAN C and PASTERNAK GW: Neuropeptides, in Encyclopedia of Neurological Sciences, (Aminoff, M. and Daroff, R., eds). Academic Press, pp. 574-577, 2003.

330. PASTERNAK GW: Opioids and Their Receptors, inEncyclopedia of Neurological Sciences, (Aminoff, M. and Daroff, R., eds). Academic Press, pp. 675-679, 2003.

331. SNYDER SH and PASTERNAK GW: Historical review: opioid receptors Trends Pharmacol. Sci., 24: 198-205, 2003.

332. NEILAN C, KING MA, ROSSI G, ANSONOFF M, PINTAR JE, SCHILLER PW and PASTERNAK GW: Differential sensitivities of mouse strains to morphine and [Dmt]DALDA analgesia. Brain Res. 974: 254-257, 2003.

333. NEILAN CL, JANVEY AJ, BOLAN E, BEREZOWSKA I, NGUYEN T M-D, SCHILLER PW and

PASTERNAK GW: Characterization of the Binding of [^{3}H][Dmt^1]DALDA, a Highly Potent Opioid Peptide. J. Pharmacol. Exp. Ther. 306: 430-436, 2003.

334. ROUSSELLE C, CLAIR P, SMIRNOVA M, KOLESNIKOV Y, PASTERNAK GW, GAC-BRETON S, REES AR, SCHERMANN JM, TEMSAMANI J: Improved brain uptakeand pharmacological activity of dalargin using a peptide-vector-mediated strategy. J. Pharmacol. Exp. Ther. 306: 371-376, 2003

335. KOLESNIKOV YA, WILSON RS, and PASTERNAK GW: Synergistic analgesic interactions between hydrocodone and ibuprofen. Anesth Analg. 97:1721-1723, 2003

336. KOLESNIKOV YA, CRISTEA M and PASTERNAK GW: Analgesic Synergy between topical morphine and butamben in mice. Anesth. Analg. 97:1103-1107, 2003.

337. PAN YX, XU J, MAHURTER L, XU M, GILBERT AK and PASTERNAK GW: Identification and characterization of two new human mu opioid receptor splice variants, hMOR1O and hMOR-1X. Biochem. Biophys. Res. Commun. 301:1057-61, 2003.

338. HARRISON BA, PASTERNAK GW and VERDINE GL: 2, 6-Dimethyltyrosine analogues of a stereodiversified ligand library: highly potent, selective, non-peptidic mu opioid receptor agonists. J. Med. Chem. 46:677-80, 2003.

339. BOLAN EA, PAN Y-X and PASTERNAK GW: Functional analysis of MOR-1 splice variants of themouse mu opioid receptor gene *Oprm*. Synapse. 51: 11-18, 2004.

340. HADJIMARKOU MM, KHAIMOVA E, PAN YX, ROSSI GC, PASTERNAK GW and BODNAR RJ: Feeding induced by food deprivation is differentially reduced by opioid receptor antisense oligodeoxynucleotide probes in rats. Brain Res. 987:223-232, 2003.

341. GILBERT AK, HOSZTAFI S, MAHURTER L and PASTERNAK GW: Pharmacological characterization of dihydromorphine, 6-acetyldihydromorphine and dihydroheroin analgesia and their differentiation from morphine. Eur. J. Pharmacol, 492: 123-130, 2004.

342. PASTERNAK GW: Alternative Splicing of Mu Receptors. In *The Genetics of Pain* (J.S. Mogil, ed). IASP Press, Seattle, WA, 85-103, 2004.

343. ABBADIE C, PAN YX and PASTERNAK GW: Immunohistochemical study of the expression of exon11-containing mu opioid receptor variants in mouse brain. Neurosc. 127:419-430, 2004.

344. PASTERNAK GW: Multiple Opiate Receptors: Déjà vuall over again. Neuropharmacol.47S1: 312-323, 2004.

345. HADJIMARKOU MM, SINGH A, KANDOV Y, ISRAEL Y, PAN YX, ROSSI GC, PASTERNAK GW, BODNAR RJ: Opioid receptor involvement in fooddeprivation-induced feeding: evaluation of selective antagonists and antisense oligodeoxynucleotides probe effects in mice and rats. JPharmacol. Exp. Ther. 311:1188-1202, 2004.

346. PASTERNAK GW: Opioid Pharmacology, in *The Neurological Basis of Pain* (M. Pappagallo, ed). McGraw-Hill, New York, pp. 61-69, 2005.

347. PASTERNAK GW: Opioid receptors, multiple, *in* Encyclopedia of Neuroscience. (G. Adelman and B. Smith, eds.) Elsevier, 2004.

348. PASTERNAK DA, PAN L, XU J, YU R, XU M, PASTERNAK GW and PAN YX: Identification of three new alternatively spliced variants of the rat mu opioid receptor gene: Dissociation of affinity and efficacy. J. Neurochem 91:881-890, 2004.

349. ZELCER S, KOLESNIKOV Y, KOVALYSHYN I, PASTERNAK DA and PASTERNAK GW: Selective potentiation of opioid analgesia by nonsteroidal anti-inflammatory drugs. Brain Res. 1040: 151-156, 2005.

350. PAN L, XU J, YU R, XU MM, PAN YX and PASTERNAK GW: Identification and characterization of six new alternatively spliced variants of the human mu opioid receptor gene, *Oprm.* Neurosci, 133:209-220, 2005.

351. DAVIS MP and PASTERNAK GW: Opioid receptors and opioid pharmaocdynamics. *In* Opioids in Cancer Pain (M. Davis, P Glare and J Hardy, eds). Oxford University Press, Oxford, 2005, pp. 43-52.

352. ISRAEL Y, KANDOV Y, KHAIMOVA E, KEST A, LEWIS SR, PASTERNAK GW, PAN YX, ROSSI GC and BODNAR RJ: NPY-induced feeding: Pharmacological characterization using selective opioid antagonists and antisense probes in rats. Peptides 26:1167-1175, 2005.

353. PAN Y-X, XU J, BOLAN E, MOSKOWITZ HS, XU MM and PASTERNAK GW: Identification of four novel MOR-1B splice variants of the mouse mu opioid receptor gene: Functional consequences of C-terminus splicing Mol. Pharmacol. 68:866-875, 2005.

354. YANG K, ZUCKERMAN A and PASTERNAK GW: Affinity labeling mu opioid receptors with novel radioligands. Cell Mol Neurobiol 25:759-765, 2005.

355. EL MAAROUT A, KOLESNIKOV Y, PASTERNAK G and RUTUSHAUSER U: Polysialic acid-induced plasticity reduces neuropathic insult to the central nervous system. Proc Nat Acad Si USA 102: 11516-11520, 2005.

356. LEVIN E, PREMKUMAR A, VEENMAN L, KUGLER W, LESCHINER S, WEISINGER, G, LAKOMEK M, WEIZMAN A, SYNDER SH, PASTERNAK GW and GAVISH M. The peripheral benzodiazepine receptor and tumorigenicity: isoquinoline binding protein (IBP) antisense knockdown in the C6 glioma cell line. Biochemistry 44: 9925-9935, 2005.

357. PASTERNAK GW: Molecular Biology of Opioid Analgesia. J Pain Symptom Management 29:S2-9, 2005.

II. In Press

358. PASTERNAK GW: Naltrexone & Opiates/Opioids & Pain: Drugs used in treatment of, *in* Encyclopedia of Drugs, Alcohol and Addictive Behavior. (R. Carson-DeWitt, ed) Macmillan, in press.

359. PASTERNAK GW: Sigma$_1$ receptors and the modulation of opioid analgesics. In *Sigma Receptors* (R. Matsumoto, W. Bowen and T.-P. Su, eds). Kluwer Academic Publishers, in press.

360. PASTERNAK GW: Opioids. In *Basic and Applied Science for Anesthesia, 2^d Edition* (H. Hemmings and P. Hopkins, eds), Mosby International, in press.

361. PASTERNAK GW and ZHANG Y: Pain Pathways. In *The Handbook of Contemporary Neuropharmacology* (D. Sibley, I. Hanin, M. Kuhar and P. Skolnick, eds)., John Wiley, New York, in press

362. PASTERNAK GW and CHILDERS, S.R.: Opioid Receptors. In *The Handbook of Contemporary Neuropharmacology* (D. Sibley, I. Hanin, M. Kuhar and P. Skolnick, eds)., John Wiley, New York, in press

363. ZHANG Y, PAN YX, KOLESNIKOV Y and PASTERNAK GW: Immunohistochemical Labeling of the Mu Opioid Receptor Carboxy Terminal Splice Variant mMOR1B4 in the Mouse Central Nervous System Brain Res, in press

364. MAHURTER L, GARCEAU C, MARINO J, SCHMIDHAMMER H, TOTH G and PASTERNAK GW:

Separation of binding affinity and intrinsic activity of the potent mu opioid 4-methoxymetopon. J. Pharmacol Exp. Ther, in press.

Abstracts

1. HARIK SI, PASTERNAK GW and SNYDER SH. Polyamines: enzymatic-isotopic assay of putrescine and blockade of its synthesis by hydrazine-ornithine. Proc. Fifth Internat. Congress Pharmacol., 5: 95, 1972.

2. HARIK SI, PASTERNAK GW and SNYDER SH. Polyamines: enzymatic isotopic assay of putrescine and blockade of its synthesis by hydrazinoornithine Proc. Soc. Neurosci., p. 242, 1972.

3. PASTERNAK GW and SNYDER SH. The opiate receptor: influence of enyzmes, ions and detergents. Proc.Soc.Neurosci., p. 350, 1973.

4. PASTERNAK GW and SNYDER SH. Opiate receptor: general properties and biochemical perturbations. Molec. Neurobiology Symposium of the Given Institute, Aspen, Colorado, p. 13, 1973.

5. PASTERNAK GW, CHILDERS SR, and SNYDER SH. The opiate receptor: dissociation of opiate analgesia and mortality from opiate overdose. Neurology, 31: 114, 1979.

6. PASTERNAK GW, CHILDERS SR and SNYDER SH. Opiate analgesia: evidence for mediation by a subpopulation of opiate receptors. Soc. Neurosci. 5:567, 1979.

7. PASTERNAK GW. Multiple opiate receptors: mediation of enkephalin, beta-endorphin and mu and kappa opiate analgesia by the same subpopulation of binding sites. Neurology, 32: 76, 1980.

8. PASTERNAK GW. Opiate and opioid peptide analgesia: mediation by single receptor population. Second Ann. Meet. Amer. Pain Soc., 1980.

9. PASTERNAK GW. Endogenous opioid systems in the central nervous system. Thirty-Second Annual Assembly Endoc. Soc., 1980.

10. PASTERNAK GW. Biochemical and pharmacological similarities between high affinity mu, kappa, delta and sigma opiate receptor binding. Soc. Neurosci., 6: 173.4, 1980.

11. ZHANG A-Z and PASTERNAK GW. Ontogeny of opiate receptors: differences between high and low affinity binding sites. Soc. Neurosci., 6: 142.1, 1980.

12. PASTERNAK GW. Pain modulation in the central nervoussystem. Postgrad. Assembly, NYS Soc. Anesthesiol, New York, 13-17 December 1980.

13. PASTERNAK GW. Spinal mechanism of opiate analgesia. Postgrad. Assembly, NYS SocAnesthesiol, New York, 13-17 December 1980.

14. PASTERNAK GW. Mu and delta opiate receptorsin the CNS: A new classification. Soc. Neurosci. 7:129, 1981.

15. CAROLL-BUATTI M and PASTERNAK GW. Phylogenetic differences in opiate receptor subtypes.Soc. Neurosci. 7:129, 1981.

16. SPIEGEL K, BUATTI M and PASTERNAK GW. The binding and analgesic properties of a sigma opiate, SKF 10, 047. Soc. Neurosci. 7:434, 1981.

17. SPIEGEL K, KOURIDES IA and PASTERNAK GW. Opiate receptor mechanisms of prolactin release in the rat. Neurology, 32: A106, 1982.

18. SPIEGEL K, KALB R and PASTERNAK GW. Analgesic properties of tricyclic antidepressants. Neurology, 32: A157, 1982

19. SPIEGEL K, KOURIDES IA and PASTERNAK GW. Release of prolactin in the rat by morphine: opiate receptor mechanisms. International Narcotics Research Conference, Sea Crest, MA, June 13-18, 1982.

20. SPIEGEL K, KOURIDES IA. and PASTERNAK GW. Opiate receptor mechanisms of prolactin and growth hormone release in the rat. Soc.Neurosci., 8: 137, 1982.

21. HAHN EF and PASTERNAK GW. Naloxazone, a potent, long-acting inhibitor of opiate binding sites and analgesia. Soc. Neurosci., 8: 389, 1982

22. LING GSF, GALETTA S and PASTERNAK GW. Receptor binding and analgesic propertiesof oxymorphazone. Soc.Neurosci., 8: 779, 1982.

23. SPIEGEL K, KOURIDES IA and PASTERNAK GW. Release of prolactin in the rat by morphine: opiate receptor mechanisms. International Narcotics Conference, Sea Crest, MA. June 13-18, 1982.

24. LING GSF, GALETTA S and PASTERNAK GW. Receptor binding and analgesic properties of oxymorphazone. International Narcotics Research Conference, Sea Crest, MAJune 13-18, 1982.

25. JOHNSON N, HOUGHTEN R and PASTERNAK GW. Binding of ^{3}H-B-endorphin in rat brain. International Narcotics Research Conference, Sea Crest, MA. June 13-18, 1982.

26. PASTERNAK GW, NISHIMURA S and WOLOZIN B. Opiate binding site heterone-y in rat brain. International Narcotics Research Conference, Sea Crest, MA. June 13-18, 1982.

27. HAHN E and PASTERNAK GW. Naloxonazine, a potent, long-acting inhibitor of opiate binding sites. International Narcotics Research Conference, Sea Crest, MAJune 13-18, 1982.

28. LING GSF and PASTERNAK GW. Different opioid receptors mediate spinal and supraspinal opioid analgesia. Amer. Acad. Neurology; Neurology, 33: A150, 1983.

29. JOHNSON N and PASTERNAK GW. The binding to rat brain homogenates of MR2034, auniversal opiate. International Narcotics Research Conference, Garmisch, West Germany. June 26-July 1, 1983.

30. GOODMAN R, HOUGHTEN RA and PASTERNAK GW. Epsilon receptor sites: autoradiographic and homogenate binding evidence for selective^{3}H-endorphin binding sites in rat brain. International Narcotics Research Conference, Garmisch, West Germany. June 26-July 1, 1983.

31. LING GSF, SPIEGEL K, NISHIMURA SL and PASTERNAK GW. Different receptors mediate morphine's analgesic and respiratory depressant actionsInternational Narcotics Research Conference, Garmisch, West Germany. June 26-July 1, 1983.

32. LING GSF and PASTERNAK GW. Different receptor mechanisms for spinal and supraspinal opioid analgesia in the mouse. International Narcotics Research Conference,Garmisch, West Germany. June 26-July 1, 1983.

33. SPIEGEL K and PASTERNAK GW. Binding and pharmacological properties of the Mμ drug meptazinol. International Narcotics Research Conference, Garmisch, West Germany. June 26-July 1, 1983.

34. NISHIMURA SL and PASTERNAK GW. Biochemical evidence for a common, very high affinity binding site for opiates and enkephalins (mμ site). International Narcotics Research Conference, Garmisch, West Germany. June 26-July 1, 1983.

35. HIESIGER EM, VOORHIES RM, LIPSCHUTZ L, BASLER G, SHAPIRO WR and PASTERNAK GW. The effects of morphine on glucose metabolism (C142-Deoxyglucose) in rat brain as measured by quantitative

autoradiography. Soc. Neurosci, 9:138, 1983.

36. LING GSF, SPIEGEL K, NISHIMURA SL and PASTERNAK GW. Dissociation of morphine's analgesic and respiratory depressant actions. Soc. Neurosci, 9:288, 1983.

37. GOODMAN RR, HOUGHTEN RA and PASTERNAK GW. Autoradiography of ^{3}H-β-endorphin binding in rat brain: evidence for epsilon sites. Soc. Neurosci, 9:175, 1983.

38. PASTERNAK GW and LING GSF. The opioid receptor mechanisms for spinal and supraspinal analgesia in the mouse differ. Soc. Neurosci, 9:741, 1983.

39. SPIEGEL K and PASTERNAK GW. Meptazinol: a unique mu_1 selective opiate. Soc. Neurosci, 9:797, 1983

40. NISHIMURA SL and PASTERNAK GW. Biochemical evidence for mu_1 sites: a common, very high affinity binding site for opiates and enkephalins. Soc. Neurosci, 9:1011, 1983.

41. KENT J, RECHT L, HIESIGER E and PASTERNAK GW. Differential development in the rat of mu_1 and mu_2 binding sites as measured by quantitative autoradiography. Soc. Neurosci, 9:727, 1983.

42. SIMONE DA, BODNEY RJ. and PASTERNAK, G.W. Naloxonazine: Dose-dependent and test-dependent effects upon morphine analgesia. Soc. Neurosci, 9:892, 1983.

43. LING GSF, SPIEGEL K and PASTERNAK GW. Evidence for different receptors mediating morphine analgesic and respiratory depression. Neurology 34 (Supl 1): 170, 1984.

44. RECHT L, NISHIMURA SL and PASTERNAK GW. Mu_1 sites in the CNS: a common, very high affinity binding site for opiates and opioid peptides. Neurology 34 (Supl 1): 278, 1984.

45. GOODMAN RR and PASTERNAK GW. Evidence for epsilon opiate receptors in rat brain by autoradiography. Am. Acad. Neurology, Neurology 34 (Supl 1): 100, 1984.

46. PASTERNAK GW. Multiple mu opioid receptors in the CNS: correlation of binding with pharmacological functions. Neurosci. Letters, 18:S 137, 1984.

47. LING GSF, MACLEOD J, LEE S, LOCKHART SH and PASTERNAK GW. Separation of morphine analgesia from physical dependence. Soc. Neurosci, 10:1112, 1984.

48. SPIEGEL K, LING GSF and PASTERNAK GW. A role of mu_2 opioid receptors in opioid respiratory depression. Soc. Neurosci, 10:1113, 1984.

49. GOODMAN RR and PASTERNAK GW. Autoradiographic demonstration of the unique distribution of mu_1 opioid receptors in rat brain. Soc. Neurosci, 10:518, 1984.

50. RECHT LD, HOLADAY J, JOHNSON N and PASTERNAK GW. Irreversible inhibition of radiolabeled opiate and opioid peptides by β-funaltrexamine (β-FNA). Soc. Neurosci, 10:586, 1984.

51. HAHN EF and PASTERNAK GW. Opiate azines: mechanism of action. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

52. ITZHAK Y and PASTERNAK GW. Interaction of relatively selective delta opioid ligands with high affinity mu_1 opioid binding sites. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

53. LING GSF, SIMANTOV, R CLARK and PASTERNAK, GW. Potency of naloxonazine in vivoon morphine analgesia and receptor binding. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

54. PASTERNAK GW and GOODMAN RR. Autoradiographic localization of mu sites in brain using a computerized subtraction technique. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

55. ADLER BA, GOODMAN RR and PASTERNAK GW. Regional differences in mu binding of ^{3}H-DADL-Enkephalin: comparisons of cortex and thalamus. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

56. ADLER BA, CLARK JA and PASTERNAK GW. Differentiation between mu and delta opioid binding by divalent cations. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

57. LING GSF, YOBURN BC, INTURRISI CE and PASTERNAK GW. Opiate receptor upregulation by chronic naltrexone pretreatment does not affect morphine induced respiratory depression. International Narcotics Research Conference, Sea Crest, MA. June 24-28, 1985.

58. ADLER BA, GOODMAN RR and PASTERNAK GW. Differences in the mu binding of ^{3}H-DADL-Enkephalin in the cortex and thalamus. Soc. Neurosci. 11:583, 1985.

59. ITZHAK Y and PASTERNAK GW. Interaction of relatively selective delta opioid ligands with high affinity mu opioid binding sites. Soc. Neurosci. 11:581, 1985

60. STILLMAN M, NAVIA B, MAST J, LEMANN W, WARRELL R and PASTERNAK GW. Delayed neurotoxicity associated with fludarabine. Neurology 35 (Suppl 1):291, 1985.

61. ADLER BA, CLARK JA and PASTERNAK GW. Differentiation between mu and delta opioid binding by divalent cations. Am. Soc. Pharmacol. Exp. Ther. Boston, MA. August, 1985.

62. MANN PE, BODNAR RJ, ROMERO MT, TRUESDELL LS and PASTERNAK GW. Selective alterations in opiate-induced feeding following naloxonazine pretreatment. Soc. Neurosci. 11:179, 1985.

63. YOBURN BC, LING GSF, PASTERNAK GW and INTURRISI CE. Naltrexone-induced supersensitivity: functional correlates in the mouse and rat. Soc. Neuroscience. 11:756, 1985.

64. BOGNACKI J and PASTERNAK GW: Isolation and purification of a mu opiate binding site. Am. Soc. Pharmacol. Exp. Ther. Baltimore, MD August 17-21, 1986.

65. CLARK JA and PASTERNAK GW: Development of a selective mu opiate receptor binding assay. Int. Narcotics Res. Conf. San Francisco, CA July 6-11, 1986.

66. ADLER BA, GOODMAN RR, and PASTERNAK, GW. Quantitative autoradiographic distribution of naloxonazine-sensitive (mu_1) binding in rat brain. Soc. Neurosci. 12:406, 1986.

67. CLARK JA and PASTERNAK GW. Mu_1 binding in the CNS: Development of a selective binding assay. Soc. Neurosci. 12:371, 1986.

68. BODNAR RJ, HAHN EF, CLARK JA and PASTERNAK GW. Irreversible oxymorphone derivatives: analysis of analgesic potency and duration. Soc. Neurosci. 12:1170, 1986.

69. MANN PE, BODNAR RJ, CURRERI G, LUBIN E, HAHN EF, and PASTERNAK GW. Chronic naloxone and naloxonazine: evidence for a specific opioid receptor subtype in maintenance of body weight and food intake. Soc. Neurosci. 12:1298, 1986.

70. BERMAN EF, BRAND LM, PASTERNAK GW, LaHANN TR, BOHNE RL, FARMER RW, and MADDIN CS.

Analgesic pharmacology of NE-19550. Soc. Neurosci. 12:376, 1986

71. CLARK JA and PASTERNAK GW: Development of a selective mu opiate receptor binding assay. Int. Narcotics Research Conf., San Francisco, CA, July 6-11, 1986.

72. BODNAR RJ, WILLIAMS C, LEE S, and PASTERNAK GW: Morphine analgesia in the periaqueductal gray and locus ceruleus: involvement of mu receptors. Neurology 37 (Suppl. 1): 187, 1987.

73. ADLER BA, GOODMAN RR, and PASTERNAK GW: Quantitative autoradiography of mu opioid binding in the rat: effects of naloxonazine. Neurology 37 (Suppl 1): 355, 1987.

74. CLARK JA and PASTERNAK GW: Characterization of mu opiate receptors in the central nervous system. Neurology 37 (Suppl. 1): 358, 1987.

75. PRICE M, LUKE M, HAHN EF and PASTERNAK GW: A novel opiate analog with veryhigh affinity for mu binding sites. Soc. Neurosci. 13:639, 1987.

76. GALETTA S, CLARK JA and PASTERNAK GW: Oxymorphone-naltrexonazine, a potent mixed agonist-antagonist. Soc. Neurosci. 13:769, 1987.

77. LING GSF, SIMANTOV R, and PASTERNAK GW: Differential development of tolerance to analgesia, respiratory depression and hormone release in a morphine infusion model. Soc. Neurosci. 13:209, 1987.

78. CLARK JA and PASTERNAK GW: [^{125}I]β-Endorphin binding: biochemical characterization and crosslinking studies. Soc. Neurosci. 13:1704, 1987.

79. GOODMAN RR, PRICE M and PASTERNAK GW: Direct autoradiographic localization of mu binding sites in rat brain with a novel opiate ligand. Soc. Neurosci. 13:639, 1987.

80. PASTERNAK GW and BODNAR RJ: Interactions of proglumide with morphine analgesia. Soc. Neurosci. 13:1001, 1987.

81. BODNAR RJ, WILLIAMS CL, LEE SJ, and PASTERNAK GW: Role for the high affinity mu opioid binding site in central opiate and opioid analgesia. Soc. Neurosci. 13:1016, 1987.

82. GISTRAK MA, PAUL D, PRICE M, HAHN EF and PASTERNAK GW: The biochemistry and pharmacology of a novel opiate agonist-antagonist analgesic. Internat. Narcotics Research Conf. Albi, France. July 3-8, 1988

83. PAUL D, BODNAR RJ and PASTERNAK GW: Different mu receptor subtypes mediate spinal and supraspinal analgesia in mice. Internat. Narcotics Research Conf. Albi, France. July 3-8, 1988

84. PAUL D and PASTERNAK GW: Naloxonazine blocks analgesia but not inhibiton of gastrointestinal transit by morphine: further evidence for mu receptor subtypes. Internat. Narcotics Research Conf. Albi, France. July-3-8, 1988

85. LING GSF, SIMANTOV R and PASTERNAK GW: Different rates of development of tolerance to analgesia and respiratory depression in a morphine infusion model. Neurology 38 (Suppl. 1): 356, 1988.

86. PASTERNAK GW, BODNAR RJ, CLARK JA, and INTURRISI CE: Morphine-6-glucuronide, a potent morphine metabolite with mu agonist actions. Neurology 38 (Suppl. 1): 111, 1988

87. GISTRAK MA, PAUL D, HAHN EF and PASTERNAK GW: Pharmacological actions of a novel mixed agonist antagonist opiate, NalBzoH. Soc. Neurosci. 14: 32, 1988.

88. PAUL D and PASTERNAK GW: Further evidence for mu receptor subtypes: differential blockade by naloxonazine of morphine analgesia and inhibition of gastrointestinal transit. Soc. Neurosci. 14: 33, 1988.

89. MANN PE, PASTERNAK GW and BRIDGES RS: Possible mu-1 opioid receptor involvement in maternal behavior in rats. Soc. Neurosci. 14: 286, 1988.

90. PASTERNAK GW, PAUL D and BODNAR RJ: Different mu opioid receptor subtypes mediate spinal and supraspinal analgesia. Soc. Neurosci. 14: 465, 1988.

91. MURTHY LR, GISTRAK MA, PRICE M and PASTERNAK GW: Solubilization of an opiate receptor complex from calf brain. Soc. Neurosci. 14: 699, 1988.

92. PAUL D, STANDIFER KM, INTURRISI CE, FOLEY KM and PASTERNAK GW: Pharmacology of morphine 6-glucuronide, a potent morphine metabolite. Fed. Am. Soc. Exp. Biol., 1989.

93. KINOUCHI K, STANDIFER KM, and PASTERNAK GW: Differential effect of dvalent cations on mu_1 and mu_2 opiate receptor binding. Internat. Narcotics Research Conf. SteAdele, Quebec. July 9-14, 1989.

94. STANDIFER KM, STEELE LL and PASTERNAK GW: Photoaffinity labeling multiple mu and kappa receptors. Internat. Narcotics Research Conf. Ste-Adele, Quebec. July 9-14, 1989.

95. GINOS JZ, STANDIFER KM and PASTERNAK GW: Comparison of the binding characteristics of naloxone benzoylhydrazone and naloxone p-hydroxy-benzoylhydrazone. Internat. Narcotics Research Conf. SteAdele, Quebec. July 9-14, 1989.

96. PAUL D, BODNAR RJ, LIU L and PASTERNAK GW: Blockade of intracerebral morphine analgesia by both pertussis and cholera toxin. Internat. Narcotics Research Conf. SteAdele, Quebec. July 9-14, 1989.

97. HUANG E, HERSH B, LIU L and PASTERNAK GW: $Kappa_3$ binding: development of a selective binding assay. Internat. Narcotics Research Conf. SteAdele, Quebec. July 9-14, 1989.

98. CLARK JA, EDELSON M and PASTERNAK GW: Evidence for two subtypes of U50,488sensitive $kappa_1$ receptors. Internat. Narcotics Research Conf. Ste-Adele, Quebec. July 9-14, 1989.

99. PASTERNAK GW and CLARK JA: Effects of magnesium on mu_1 binding: evidence against a simple bimolecular binding model. Internat. Narcotics Research Conf. SteAdele, Quebec. July 9-14, 1989.

100. HUANG E, HERSH B, LIU L, and PASTERNAK GW: $Kappa_3$ binding: development of a selective binding assay. Soc. Neurosci. 15: 564, 1989.

101. PASTERNAK GW, STANDIFER KM, and STEELE LL: Photoaffinity labeling multiple mu and kappa receptors. Soc. Neurosci. 15: 565, 1989.

102. PAUL D, HUANG E and PASTERNAK GW: Autoradiographic localization of kappa opioid binding sites with [^{3}H]NalBzoH. Soc. Neurosci. 15: 230, 1989.

103. KINOUCHI K, STANDIFER KM and PASTERNAK GW: Differential effect of divalent cations on mu_1, mu_2 and delta opiate receptor binding. Soc. Neurosci. 15: 565, 1989.

104. LIU L, CLARK JA, EDELSON M and PASTERNAK GW: Evidence for two subtypes of U50,488sensitive $kappa_1$ receptors. Soc. Neurosci. 15: 565, 1989.

105. STANDIFER KM, CLARK JA, and PASTERNAK GW: Evidence against a simplebimolecular model for mu_1 binding. Soc. Neurosci. 15: 565, 1989.

106. PAUL D, PICK CG and PASTERNAK GW: Dissociation of κ_1 and κ_3 analgesia: pharmacological characterization of naloxone benzoylhydrazone. Int. Narcotics Res. Conf., Noordwijkerhout, The Netherlands, July 8-13, 1990.

107. TIVE LA, PAUL D, LIU L and PASTERNAK GW: Partial agonist effects of ethylketocyclazocine at supraspinal μ_1 receptors. Int. Narcotics Res. Conf., Noordwijkerhout, The Netherlands, July 8-13, 1990.

108. STANDIFER KM, PAUL D, HOWARD D, LEVISON J and PASTERNAK GW: Differential effects of dexamethasone on opioid receptor-mediated analgesia and selective binding. Int. Narcotics Res. Conf., Noordwijkerhout, The Netherlands, July 8-13, 1990.

109. STANDIFER KM, LIU L, PARAMESWARAN R, GINOS JZ and PASTERNAK GW: Structure-activity relations of naloxone benzoylhydrazone (NalBzoH): Effects on subtype selectivity and dissociation kinetics. Soc. Neurosci. 16: 1990.

110. TIVE LA, PAUL D, GACEL GA, ROQUES BP and PASTERNAK GW: Pharmacological characterization of the mu-selective drug, TRIMU-5. Soc. Neurosci. 16: 1990.

111. PICK CG, PAUL D and PASTERNAK GW: Naloxonazine and β-funaltrexamine antagonism of μ actions: further evidence for distinct μ_1 and μ_2 receptors. Soc. Neurosci. 16: 1990.

112. PAUL D, PICK CG, TIVE LA and PASTERNAK GW: Pharmacological characterization of nalorphine, a kappa$_3$ analgesic. Soc. Neurosci. 16: 1990.

113. BODNAR RJ, PAUL D and PASTERNAK GW: Inhibition of morphine analgesia by ethylketocyclazocine pretreatment in rat periaqueductal gray and locus coeruleus. Soc. Neurosci. 16: 1990.

114. PASTERNAK GW, STANDIFER KM, KINOUCHI K, HUANG E and STEELE LL: Photoaffinity labeling multiple mu and kappa receptors. Neurology 40 (Suppl. 1): 1990.

115. INTURRISI CE, CERBONE DJ, CHEN D, YOBURN BC, PASTERNAK GW, PORTENOY RK and FOLEY KM: Species dependent accumulation of morphine-6-glucuronide (M-6-G) after morphine (MOR) administration. Am. Pain Soc., St. Louis, MO, Oct., 1990.

116. STANDIFER KM, CHENG J, BIEDLER JL and PASTERNAK GW: Expression of μ, δ, and κ_3 binding sites in a human neuroblastoma cell line. Soc. Neurosci. 17:362, 1991.

117. CHENG J, PICK CG and PASTERNAK GW: Pharmacology and binding of kappa$_3$ opiate receptors in mice. Soc. Neurosci. 17:594, 1991.

118. TIVE L, GINSBERG K, PICK CG and PASTERNAK GW: Pharmacological characterization of the analgesic effects of levorphanol. Soc. Neurosci. 17:813, 1991

119. PICK CG, PAUL D and PASTERNAK GW: Pharmacological characterization of nalbuphine, a mixed kappa$_2$ and kappa$_3$ opioid analgesic. Soc. Neurosci. 17:1539, 1991.

120. FROIMOWITZ M, PICK C and PASTERNAK GW: Opioid receptor subtype selectivity of the phenylmorphans and analogs. In Problems of Drug Dependence 1991: Proceedings of the 53rd Annual Scientific Meeting of the Committee on Problems of Drug Dependence, Inc. Louis Harris, Ph.D., ed. U.S Government Printing Office p.254, 1992.

121. STANDIFER KM, CHENG J, BIEDLER JL and PASTERNAK GW, Inhibition of cAMP accumulation by independent μ, δ, and κ_3 opioid receptors in a human neuroblastoma cell line. Int. Narcotics Res. Conf., Keystone, CO, June 25-27, 1992.

122. CHENG J, STANDIFER KM, BIEDLER JL and PASTERNAK GW, Opioid receptors in neuroblastoma SK-N-BE(2)-C cells, Int. Narcotics Res. Conf., Keystone, CO, June 25-27, 1992.

123. CISZEWSKA G, STANDIFER KM, GINOS J, CHARTON M and PASTERNAK GW, Structure-activity relationship of naloxone benzoylhydrazone derivatives. Int. Narcotics Res. Conf., Keystone, CO, June 25-27, 1992.

124. PICK CG and PASTERNAK GW: Different brainstem mu opioid mechanisms involved with supraspinal analgesia and synergism with spinal systems. Int. Narcotics Res. Conf., Keystone, CO, June 25-27, 1992.

125. PICK CG and PASTERNAK, GW: Different mu opioid receptor subtypes mediate supraspinal analgesia and descending brainstem modulation of spinal analgesia. Neurology , 1992

126. ROSSI GC, BODNAR RJ and PASTERNAK GW: Morphine synergy between the periaqueductal gray and the nucleus raphe magnus. American Neurological Association, 1992.

127. PICK CG and PASTERNAK GW: Independent genetic control of two pharmacologically distinct brainstem mu analgesic systems. Soc. Neurosci. 18:659, 1992

128. KOLESNIKOV YA, PICK CG and PASTERNAK GW: Inhibition of morphine tolerance by nitric oxide syntetase inhibitor N^G-nitro-L-arginine. Soc. Neurosci. 18:657, 1992.

129. ROSSI GC, PASTERNAK GW, KIEFEL JM and BODNAR RJ: Supraspinal morphine analgesia: synergy between mesencephalic, pontine and medullary sites in rats. Soc. Neurosci. 18:834, 1992.

130. TISEO PJ, CHENG J, PASTERNAK GW and INTURRISI CE: The competitive NMDA antagonist, LY274614, alters morphine tolerance but not opioid receptors or morphine's distribution. Soc. Neurosci. 18:444, 1992.

131. STANDIFER KM, CISZEWSKA G, CHENG J, GINOS JZ, BIEDLER JL and PASTERNAK GW: affinity labeling human opioid receptors with a novel iodinated derivative of NalBzoH. Soc. Neurosci. 18:1511, 1992.

132. CHENG J, ZHU Y, INTURRISI CE, STANDIFER KM, BIEDLER JL and PASTERNAK GW: Expression of c-fos and preproenkephalin (PPenk) mRNA in human neuroblastoma SKN-BE(2) cells. Soc. Neurosci. 18: 1513, 1992.

133. PICK CG and PASTERNAK GW: Nalbuphine, a mixed opioid agonist/antagonist analgesic in mice. Israel Society for Biological Psychiatry, 1992,

134. KATZ Y, WEIZMAN A, PICK CG, PASTERNAK GW, LIU L, ROSENBERG B and GAVISH M: Interactions between laudanosine and opioid subtype receptors. Israel Society for Biological Psychiatry, 1992.

135. PICK CG and PASTERNAK GW: Different brainstem mu opioid receptor subtypes produce supraspinal analgesia and spinal/supraspinal analgesic synergism. 5th International Congress THE PAIN CLINIC, Jerusalem, Israel, 1992.

136. KOLESNIKOV YA, PICK CG and PASTERNAK GW: Prevention of tolerance to morphine but not kappa opioids by an inhibitor of nitric oxide synthase. College on Problems of Drug Dependence, Toronto, June 17, 1993.

137. STANDIFER KM, CHIEN, C.-C., WAHLESTADT C and PASTERNAK GW: Reduction of delta opioid binding in NG108 cells by antisense. Int. Narcotics Res. Conference, Skovde, Sweden, July 10-15, 1993.

138. BROWN G, STANDIFER KM and PASTERNAK GW: Affinity labeling of κ opioid receptors. Int. Narcotics

Res. Conference, Skovde, Sweden, July 10-15, 1993.

139. CHENG, J, STANDIFER KM and PASTERNAK GW: κ_3 opiate receptor in SH-SY5Y Neuroblastoma cells, Int. Narcotics Res. Conference, Skovde, Sweden, July 10-15, 1993

140. KOLESNIKOV Y, FERKANY J and PASTERNAK GW: Blockade of mu and kappa opioid analgesic tolerance by NPC17742, a novel NMDA antagonist. Int. Narcotics Res. Conference, Skovde, Sweden, July 10-15, 1993.

141. KOLESNIKOV Y, BABEY AM, PICK CG and PASTERNAK GW: Blockade of morphine tolerance by nitric oxide synthase inhibitors. Int. Narcotics Res. Conference, Skovde, Sweden, July 10-15, 1993.

142. LIPKOWSWI AW, PASTERNAK GW, MISTEREK, BUMULKA SW and PACHOCKA M: The synthesis and biological properties of new naltrexone-peptide hybrids. Int. Narcotics Res. Conference, Skovde, Sweden, July 10-15, 1993.

143. INTURRISI CE, ELLIOTT K, MINAMI, N, KOLESNIKOV YA, PASTERNAK GW and FOLEY KM: NMDA receptor antagonists attenuate analgesic tolerance to morphine, but not to kappa opioids. Soc. Neurosci. 19:556.3, 1993.

144. VISCONTI LM, STANDIFER KM, SCHILLER P and PASTERNAK GW: A new assay for mu binding in calf thalamic membranes using a novel,highly selective delta ligand. Soc. Neurosci.19:476.13, 1993.

145. BABEY AM, CHENG J, VISCONTI L, STANDIFER KM and PASTERNAK GW: δ Opioid receptor binding in three human neuroblastoma cell lines. Soc. Neurosci. 19:476.15, 1993.

146. CHENG J, STANDIFER KM and PASTERNAK GW: λ_3 opiate receptors are present inSH-SY5Y neuroblastoma cells. Soc. Neurosci. 19:476.14, 1993.

147. BROWN GP, STANDIFER KM and PASTERNAK GW: Biochemical characterization of λ opiate binding sites in R1.1 thymoma cells. Soc. Neurosci. 19:476.2, 1993.

148. CHIEN C.-C. and PASTERNAK GW: Antagonism of opioid analgesia: a functional role for sigma receptors. Soc. Neurosci. 19:638.18, 1993.

149. STANDIFER KM, CHIEN CC, WAHLESTEDT C and PASTERNAK GW: Reduction of delta opioid binding in NG108-15 neurohybrid cells by a specific antisense oligonucleotide.Soc. Neurosci. 19:37.13, 1993.

150. BROOKS AI, STANDIFER KM, CISZEWSKA GR, CHENG J and PASTERNAK GW: Expression of κ_3 and μ binding sites in bufo marinus (giant toad) and carassius auratus (goldfish) brain. Soc. Neurosci. 19:476.16, 1993.

151. KOLESNIKOV Y, BABEY AM, CHENG J, TRIFILETTI RR and PASTERNAK GW: Blockade of morphine tolerance by nitric oxide synthase inhibitor: behavioral and biochemical data. Soc. Neurosci. 19:736.8, 1993.

152. ROSSI G, PASTERNAK GW, COOPER ML and BODNAR RJ: Supraspinal analgesic synergy in rats and opioid receptor subtype agonists. Soc. Neurosci. 19:736.10, 1993.

153. KHANOLKARAD, MAKRIYANNIS A, BROOKS AI, PASTERNAK GW AND FROIMOWITZ, M: Morphine-like and non-morphine-like structures of opioid 4-phenylpiperidines. College on Problems of Drug Dependence, NIDA Research Monograph 141: 48, 1993.

154. BILSKY EF, BERNSTEIN RN, ROTHMAN RB, PASTERNAK GW, LAI J and PORRECA F: Antisense oligodeoxynucleotide to the cloned delta opioid receptor selectively inhibits supraspinal, but not spinal, antinociceptive effects of [D-Ala^2,Glu^4]deltophrin. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

155. BABEY AM, STANDIFER KM, BIEDLER JL and PASTERNAK GW: Evidence that the delta receptor population in a human neuroblastoma cell line may be comprised of both delta$_1$ and delta$_2$ subtypes. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

156. BROWN GP, CHIEN CC, STANDIFER KM and PASTERNAK GW: Blockade of kappa$_3$ receptor mediated analgesia by antisense oligodeoxynucleotides. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

157. CHENG J, PAN, YX and PASTERNAK GW: Blockade of kappa$_3$ analgesia by an antisense oligodeoxynucleotide. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

158. CHIEN CC and PASTERNAK GW: Strain differences in the tonic antiopioid activity of sigma systems. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

159. VISCONTI L, STANDIFER KM, SCHILLER P and PASTERNAK GW: An improved mu$_1$ receptor assay using TIPP[ψ], a highly selective delta antagonist. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

160. ROSSI G, PAN YX and PASTERNAK GW: Reduction of mu antinociception in the rat by an antisense oligodeoxynucleotide against the mu receptor. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

161. BROOKS AI, STANDIFER KM, HAMMERLING U, CHUA R and PASTERNAK GW: A monoclonal antibody to the kappa$_3$ receptor. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

162. RYAN-MORO JP, STANDIFER KM, CHIEN CC, BABEY AM, BIEDLER JL and PASTERNAK GW: Sigma receptor in the BE (2)-C human neuroblastoma cell line. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

163. KOLESNIKOV YA, MACCIACHINI ML and PASTERNAK GW: prevention of mu and delta opioid tolerance by ACPC, a ligand for the glycine site on the NMDA receptor. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

164. PAN YX, XU J, CHENG J, and PASTERNAK GW: Cloning and characterization of a novel opioid receptor associated with kappa$_3$ opioid analgesia. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

165. STANDIFER KM, CHIEN CC, PAN YX and PASTERNAK GW: Uptake and stability of oligodeoxynucleotides based upon the cloned delta opiate receptor, DOR-1. Internat. Narcotics Res. Conf., Sea Crest MA, July 16-21, 1994.

166. STANDIFER KM, CHIEN CC, JENAB S, INTURRISI CE, PAN YX and PASTERNAK GW: Oligodeoxynucleotides to the cloned delta opiate receptor, DOR1: uptake, stability and regulation of receptor gene expression. Soc. Neurosci. 20: 932, 1994.

167. CHENG J, PAN YX, XU-PAN J and PASTERNAK GW: An antisense oligodeoxynucleotide to a novel opioid receptor blocks kappa$_3$ analgesia. Soc. Neurosci. 20: 744, 1994.

168. PAN YX, XU J, CHENG J, BROOKS AI, FURNEAUX H and PASTERNAK GW: Cloning and characterization of a novel opioid receptor associated with kappa$_3$ opioid analgesia. Soc. Neurosci. 20: 744, 1994.

169. 169. BROOKS AI, STANDIFER KM and PASTERNAK GW: A monoclonal antibody to the kappa$_3$ opiate receptor. Soc. Neurosci. 20: 1729, 1994.

170. COLE JL, LEVENTHAL L, PASTERNAK GW, BOWEN WD and BODNAR RJ: Blockade of dietary obesity development by central selective opioid antagonists in rats. Soc. Neurosci. 20: 1225, 1994.

171. BABEY AM, STANDIFER KM, CHEN J., BIEDLER JL and PASTERNAK GW: CHP-212 a human

neuroblastoma cell line, expresses a heterogenous population of δ opioid receptor. Soc. Neurosci: 20:1730, 1994

172. ROSSI G, PAN YX, CHENG J and PASTERNAK GW: Decrease of morphine analgesia by an antisense oligodeoxynucleotide against the mu receptor in the rat. Soc. Neurosci. 20: 749, 1994.

173. BROWN GP, OUERFELLI O, ROSSI G, WATANABE KA, and PASTERNAK GW: Synthesis of ^{3}H-morphine-6β-glucuronde: a potent opioid analgesic. Soc. Neurosci. 20:748, 1994.

174. CHIEN CC, RYAN-MORO JP, STANDIFER KM, BIELDER JL and PASTERNAK GW: Further in vivo and in vitro characterization of sigma$_1$ antiopioid systems. Soc. Neurosci. 20:747, 1994.

175. BABEY AM, BROWN GP, RYAN-MORO JP and PASTERNAK GW: Stably expressing DOR-1 CHO cells appear to contain a high proportion of uncoupled delta receptors. Internat. Narcotics Res. Conf., Fife Scotland, July 9-13, 1995.

176. BROWN GP, PASTERNAK GW: G-protein dependence of high affinity naloxone benzoylhydrazone binding to stably expressed MOR-1. Internat. Narcotics Res. Conf., Fife Scotland, July 913, 1995.

177. CHIEN CC, CARROLL FI, BOWEN WD, PAN YX, BROWN GP and PASTERNAK GW: Biochemical characterization of [^{125}] (-)-pentazocine, a novel sigma radioligand. Internat. Narcotics Res. Conf., Fife Scotland, July 9-13, 1995.

178. KOLESNIKOV Y, JAIN S and PASTERNAK GW: Modulation of opioid analgesia by agmatine,an imidozoline receptor ligand.
179. Internat. Narcotics Res. Conf., Fife Scotland, July 913, 1995.

180. MATHIS JP, STANDIFER KM, SU W and PASTERNAK GW: Native expression of a kappa-related opioid receptor in a mouse osteosarcoma cell line, MC3T3E1. Internat. Narcotics Res. Conf., Fife Scotland, July 913, 1995.

181. PAN YX, XU J and PASTERNAK GW: Structure and characterization of the gene encoding a kappa-related opioid receptor. Internat. Narcotics Res. Conf., Fife Scotland, July 913, 1995.

182. ROSSI GC, STANDIFER KM and PASTERNAK GW: Differential blockage of morphine and morphine6-β-glucuronide analgesia by antisense oligodeoxynucleotides directed against Gproteins. Internat. Narcotics Res. Conf., Fife Scotland, July 9-13, 1995.

183. STANDIFER KM, ROSSI GC and PASTERNAK GW: Selective blockage of μ- and κ$_3$-mediated analgesia by antisense oligodeoxynucleotides directed against distinct Gprotein α subunits. Internat. Narcotics Res. Conf., Fife Scotland, July 9-13, 1995.

184. COLE JL, LEVENTHAL L, ROSSI GC, PAN YX, RAGNAUTH A, YU WZ, PASTERNAK GW and BODNAR RJ: Selective reductions in body weight and ingestive responses by antisense oligodeoxynucleotides against different regions of the MOR-1 clone. Soc. Neurosci. 21:362, 1995.

185. HOM JSH, PAN YX, BROOKS AI, STANDIFER KM, MATHIS JP, SCHEINBERG DA and PASTERNAK GW: Characterization of the kappa-like opioid receptor on RAJI B lymphoma cells. Soc. Neurosci. 21:527, 1995.

186. MATHIS JP, STANDIFER KM, SU W and PASTERNAK GW: Expression of a kappa-related (KOR-3) opioid receptor in a mouse osteosarcoma cell line, MC3T3E1. Soc. Neurosci. 21:1353, 1995.

187. BABEY AM, BROWN GP, RYAN-MORO JP and PASTERNAK GW: Binding profiles of δ-specific agonists in a stably transfected DOR-1 CHO cell line suggest the presence of a high proportion ofuncoupled receptors. Soc. Neurosci. 21:1354, 1995.

188. CHIEN CC and PASTERNAK GW: (-)-pentazocine analgesia is mediated through kappa opioid receptors and is modulated by an anti-opioid sigma$_1$ system. Soc. Neurosci. 21:1362, 1995.

189. PAN YX, XU J and PASTERNAK GW: KOR-3: Structure and characterization of a kappa3-related opioid receptor gene. Soc. Neurosci. 21:1362, 1995.

190. ROSSI GC, STANDIFER KM and PASTERNAK GW: Differential downregulation of morphine and morphine-6-β-glucuronide analgesia in the rat by MOR-1 and G-protein antisense oligodeoxynucleotides. Soc. Neurosci. 21:1864, 1995.

191. STANDIFER KM, ROSSI GC and PASTERNAK GW: Morphine- (μ), nalbzoh- (κ_3), and mophine-6β-glucuronide- (M6G) mediated analgesic systems are differentially blocked by antisense DNA directed against distinct G-protein α subunits. Soc. Neurosci. 21:1864, 1995.

192. BROWN GP and PASTERNAK GW: μ-receptor antagonist binding of naloxone benzoylhydrazone to stably expressed MOR-1 displays G-protein dependence. Soc. Neurosci. 21:1997, 1995.

193. ROSSI GC, YANG K and PASTERNAK GW: Pharmacological characterization of morphine-6-β-glucuronide: Role of a novel opioid receptor. Internat. Narcotics Res. Conf., Long Beach CA, July 1996.

194. ROSSI GC, LEVENTHAL L, BOLAN EA and PASTERNAK GW: Orphanin/FQ or nociceptin: Evidence for analgesia and hyperalgesia in the CD-1 mouse. Internat. Narcotics Res. Conf., Long Beach CA, July 1996.

195. MATHIS JP, RYAN-MORO J, CHANG AH, HOM JSH and PASTERNAK GW: Heterogeneity of orphanin FQ/nociceptin binding in mouse brain. Internat. Narcotics Res. Conf., Long Beach CA, July 1996.

196. PAN YX, XU J, RYAN-MORO J, MATHIS JP, HOM JSH, MEI JF and PASTERNAK GW: A chimeric study of KOR-3/ORL-1 receptor structure and function. Internat. Narcotics Res. Conf., Long Beach CA, July 1996.

197. BROWN GP, YANG K, ROSSI GC, LEVENTHAL L, OUERFELLI K, WATANABE K and PASTERNAK GW: *In vivo* and *in vitro* characterization of morphine-6β-glucuronide receptors. Internat. Narcotics Res. Conf., Long Beach CA, July 1996.

198. YANG K, BORNMANN WG, RYAN-MORO J and PASTERNAK GW: Synthesis and binding properties of N-aminoethyl derivatives of 6-naloxamine. Internat. Narcotics Res.Conf., Long Beach CA, July 1996.

199. KIM JH, STANDIFER KM, HESTON WDW, PASTERNAK GW, WISE GJ and FAIR WR: Radioligand demonstration of the kappa$_3$ opioid receptor in human prostatic carcinoma cells. American Urological Assoc., Orlando FL, 1996.

200. DU Y-L, ELLIOTT K, PAN Y-X, PASTERNAK GW and INTURRISI: A splice variant of the mu opioid receptor is present in human SHSY-5Y cells. Society for Neuroscience, New Orleans, LA, October 1997.

201. MATHIS JP, RYAN-MORO JP, GOLDBERG IE, ROSSI GC, LEVENTHAL L and PASTERNAK GW: Characterization of a novel orphanin FQ/nociceptin binding site in mouse brain with a high affinity for orphanin FQ/nociceptin 1-11. Society of Neuroscience, New Orleans, LA, October 1997.

202. ROSSI GC, MATHIS JP, LEVENTHAL L and PASTERNAK GW: Pharmacological characterization of prepro-orphanin$_{141-157}$ (OFSQ): A potent spinal and supraspinal analgesic. Society for Neuroscience, New Orleans, LA, October 1997.

203. KOLESNIKOV YA, PAN YX, BABEY AM, JAIN S, WILSON R and PASTERNAK GW: Functionally differentiating two nNOS isoforms through antisense mapping: Evidence for opposing no actions on morphine

analgesia and tolerance. Society for Neuroscience, New Orleans, LA, October 1997.

204. KING MA, ROSSI GC, CHANG A and PASTERNAK GW: Antisense mapping of theanti-opioid property of orphanin FQ/nociceptin in mice. Society for Neuroscience, New Orleans, LA, October 1997.

205. BROWN GP, YANG K, KING MA, ROSSI GC, LEVENTHAL L, CHANG A and PASTERNAK GW: Selective blockade of heroin but not traditional mu, delta, and kappa analgesia by 3-methoxynaltrexone. Society for Neuroscience, New Orleans, LA, October 1997.

206. BOLAN EA, SCHULLER A, YANG K, BROWN GP, PINTAR JE and PASTERNAK GW: ^{3}H-Morphine-6-glucuronide binding in MOR-1 knockout mice. Society for Neuroscience, New Orleans, LA, October 1997.

207. MEI J, PAN Y-X, XU J, KING MA, CHANG A and PASTERNAK GW: Cloning and functional characterization of the mouse sigma$_1$ receptor. Society for Neuroscience, New Orleans, LA, October 1997.

208. LEVENTHAL L, STEVENS LB, SU W, ROSSI GC, PASTERNAK GW and BODNAR RJ: Morphine-6β-glucuronide hyperphagia: Characterization using antisense oligodeoxynucleotides targeted against the MOR clone in rats. Society for Neuroscience, New Orleans, LA, October 1997.

209. BODNAR RJ, KRZANOWSKA E, LEVENTHAL L, ROSSI GC, MATHIS JP and PASTERNAK GW: Pharmacological characterization of endomorphin-1 and endomorphin-2 analgesia and gastrointestinal transit in mice. Society for Neuroscience, New Orleans, LA, October 1997.

210. PAN Y-X, MEI J, XU J, KING MA, CHANG A, WAN B-L and PASTERNAK GW: Cloning and characterization of a mouse sigma$_1$ receptor. Int. Narcotics Res. Conf., Hong Kong 1997.

211. LEVENTHAL L, MATHIS JP, ROSSI GC, PASTERNAK GW and BODNAR RJ: Orphanin opioid receptor antisense probes block orphanin FQ-induced hyperphagia in rats. Society for Neuroscience, Los Angeles, CA, November 1998.

212. BURDICK K, YU WZ, RAGNAUTH A, MOROZ M, PAN YX, ROSSI GC, PASTERNAK GW and BODNAR RJ: Antisense mapping of opioid receptor clones: Effects upon 2deoxy-D-glucose hyperphagia. Society for Neuroscience, Los Angeles, CA, November 1998.

213. ABBADIE C, PAN YX and PASTERNAK GW: Distribution of a new splice variant of the mu opioid receptor (MOR1) in the rat central nervous system. Society for Neuroscience, Los Angeles, CA, November 1998.

214. KING MA, SCHULLER AGP, ZHU J, ZHANG J, PINTAR JE and PASTERNAK GW: Requirement of enkephalin/delta receptor systems in morphine tolerance. Society for Neuroscience, Los Angeles, CA, November 1998.

215. LETCHWORTH SR, MATHIS JP, ROSSI GC, BODNAR RJ and PASTERNAK GW: Differential distribution of ^{125}I[Tyr^{14}]OFQ/N and ^{125}I[Tyr^{10}]OFQ/N(1-11) in rat brain. Society for Neuroscience, Los Angeles, CA, November 1998.

216. MATHIS JP, ROSSI GC, ZUCKERMAN AB, LEVENTHAL L, ALLEN RG and PASTERNAK GW: Murine prepro-orphanin 160-187 analgesia in mouse brain. Society for Neuroscience, Los Angeles, CA, November 1998.

217. MEI J and PASTERNAK GW: Molecular cloning and pharmacological characterization of rat sigma$_1$ receptor. Society for Neuroscience, Los Angeles, CA, November 1998.

218. PAN YX, XU J, ROSSI GC, LEVENTHAL L, WAN BL, ZUCKERMAN AB and PASTERNAK GW: Cloning and expression of a novel splice variant of the mouse mu opioid receptor (MOR1) gene. Society for Neuroscience, Los Angeles, CA, November 1998.

219. XU J, PAN YX, WAN BL, ZUCKERMAN AB and GW PASTERNAK: Identification of multiple alternative splice variants of the KOR-3/ORL-1 receptor gene that are expressed differentially in mouse brain. Society for Neuroscience, Los Angeles, CA, November 1998.

220. MATHIS JP, ROSSI GC, ZUCKERMAN AB, LEVENTHAL L, ALLEN RG and PASTERNAK GW: Analgesic activity of murine prepro-orphanin 160-187 in mouse brain. Int. Narcotics Res. Conf., Munich, Germany, 1998.

221. KING MA, SCHULLER AGP, ZHANG J, PINTAR JE and PASTERNAK GW: Enkephalin/delta receptor systems involvement in opioid tolerance. Int. Narcotics Res. Conf., Munich, Germany, 1998.

222. ABBADIE C, PAN YX and PASTERNAK GW: Distribution of a new splice variant of the mu opioid receptor (MOR1) in the rat CNS. Int. Narcotics Res. Conf., Munich, Germany, 1998.

223. PANYX, XU J, ROSSI GC, LEVENTHAL L, WAN BL, ZUCKERMAN AB and PASTERNAK GW: Identification and characterization of a novel splice variant of the mouse mu opioid receptor (MOR1) gene. Int. Narcotics Res. Conf., Munich, Germany, 1998.

224. PAN YX, XU J, WAN BL, ZUCKERMAN AB and PASTERNAK GW: Cloning and expression of multiple alternative splice variants of the KOR-3/ORL-1 receptor gene. Int. Narcotics Res. Conf., Munich, Germany, 1998.

225. XU J, PAN YX, WAN BL, ZUCKERMAN AB and PASTERNAK GW: Structure and alternative splice variants of the rat KOR-3/ORL-1 receptor gene. Int. Narcotics Res. Conf., Munich, Germany, 1998.]

226. KOLESNIKOV YA and PASTERNAK GW: Topical morphine analgesia and tolerance. Int. Narcotics Res. Conf., Munich, Germany, 1998.

227. LETCHWORTH SR, MATHIS JP, ROSSI GC, BODNAR RJ and PASTERNAK GW: Autoradiographic localization of ^{125}I[Tyr^{14}]OFQ/N and ^{125}I[Tyr^{10}]OFQ/N (1-11) in rat brain. Int. Narcotics Res. Conf., Munich, Germany, 1998.

228. PAN Y-X, XU J, ROSSI GC, LEVENTHAL L, WAN B-L, ZUCKERMAN AB, and PASTERNAK GW: Cloning and expression of a novel splice variant of the mouse mu-opioid receptor (MOR1) gene. Soc. Neurosci. 24:524, 1998.

229. KING MA, SCHULLER AGP, ZHU J, ZHANG J, PINTAR JE, and PASTERNAK GW: Requirement of enkephalin/delta receptor systems in morphine tolerance. Soc. Neurosci. 24:524, 1998.

230. SCHULLER AGP, KING M, SHERWOOD AC, PINTAR JE, and PASTERNAK GW: M6G, but not morphine, inhibits GI transit in mu opioid receptor deficient mice. Soc. Neurosci. 24:524, 1998.

231. ZHANG J, KING M, PASTERNAK GW, and PINTAR JE: Production and analgesic characterization of KOR-1 deficient mice. Soc. Neurosci. 24:525, 1998.

232. MATHIS JP, ROSSI GC, ZUCKERMAN AB, LEVENTHAL L, ALLEN RG, and PASTERNAK GW: Murine prepro-orphanin 160-187 analgesia in mouse brain. Soc. Neurosci. 24:1010, 1998.

233. ABBADIE C, PAN Y-X, and PASTERNAK GW: Distribution of a new splice variant of the mu opioid receptor (MOR1) in the rat central nervous system. Soc. Neurosci. 24:1010, 1998.

234. LETCHWORTH SR, MATHIS JP, ROSSI GC, BODNAR RJ, and PASTERNAK GW: Differential distribution of ^{125}I[TYR^{10}]OFZ/N(1-11) in rat brain. Soc. Neurosci. 24:1010, 1998.

235. PINTAR JE, KING MA, BRADSHAWL S, SCHULLER A, and PASTERNAK GW: Potentiation of opioid

analgesia in D2 receptor mutant mice. Soc. Neurosci. 24:1353, 1998.

236. LEVENTHAL L, MATHIS JP, ROSSI GC, PASTERNAK GW, and BODNAR RJ: Orphanin opioid receptor antisense probes block orphanin FX-induced hyperphagia in rats. Soc. Neurosci. 24:1356, 1998.

237. BURDICK K, YU W-Z, RAGNAUTH A, MOROZ M, PAN Y-X, ROSSI GW, PASTERNAK GW, and BODNAR RJ: Antisense mapping of opioid receptor clones: Effects upon 2deoxy-D-glucose hyperphagia. Soc. Neurosci. 24:1356, 1998.

238. MEI J, and PASTERNAK GW: Molecular cloning and pharmacological characterization of rat sigma receptor. Soc. Neurosci. 24:1593, 1998.

239. XU J, PAN Y-X, WAN B-L, ZUCKERMAN AB, and PASTERNAK GW: Identification of multiple alternative splice variants of the KOR-3/ORL-1 receptor gene that are expressed differentially in mouse brain. Soc. Neurosci. 24:1595, 1998.

240. SILVA RM, ROSSI GC, MATHIS JP, STANDIFER KM, PASTERNAK GW, and BODNAR RJ: Morphine-6β-glucuronide-induced feeding are differentially reduced by Gprotein α subunit antisense probes in rats. Soc. Neurosci. 25:179, 1999.

241. SHANE R, Rossi GC, ALLEN R, MATHIS JP, PASTERNAK GW, and BODNAR RJ: Analgesic actions of orphanin FQ/Nociception fragments in the ventrolateral periaqueductal gray and amygdala in rats. Soc. Neurosci. 25:1438, 1999

242. KING, MA, FREYE, E, CHANG, AH, MEI, J, LATASCH, L, VOLKMANN, S, SCHMIDHAMMER, H, and PASTERNAK, GW: 14-Methoxymetopon: A very potent analgesic. Soc. Neurosci. 25:1478, 1999.

243. ABBADIE, C, PAN, Y-X, and PASTERNAK, GW: Distribution of a splice variant of the mu opioid receptor-1, MOR-1D, in the murine central nervous system. Soc. Neurosci. 25:926, 1999.

244. PAN, Y-X, XU, J, CHANG, A, BOLAN, E, MAHURTER L, ROSSI, G, and PASTERNAK, GW: Identification and characterization of a novel splice variant (MOR1F) of the mouse mu opioid receptors. Soc. Neurosci. 25:1034, 1999.

245. CRUCIANI, RA, ROSSI, GC, and PASTERNAK, GW: Antisense oligonucleotides to Gα prevents the decline of morphine analgesia over time in mice. Soc. Neurosci. 25:1478, 1999.

246. MATHIS, JP, GOLDBERG, IE, CHANG, AH, RYAN-MORO, J, ALTEMEMI, GF, STANDIFIER, KM, and PASTERNAK, GW: Characterization of orphanin FQ/nociceptin binding in BE(2)C, human neuroblastoma cells. Soc. Neurosci. 25:1473, 1999.

247. BOLAN, EA, ZUCKERMAN, AB, de PAULIS, T, SCHMIDT, D, SPECTOR, S, and PASTERNAK, GW: Pharmacological characterization of morphine-6-sulfate and codein-6-sulfate. Soc. Neurosci. 25:1476, 1999.

248. SU, W, KING, MA, HOSZTAFI, S, GOLDBERG, IE, and PASTERNAK, GW: In vivo characterization of morphine 6-nicotinate and morphine 3,6-dinicotinate. Soc. Neurosci. 25:1478, 1999.

249. ROSSI, GC, and PASTERNAK, GW: Spinal and supraspinal antinociceptive effects of endomorphin1 and endomorphin-2 in the rat. Soc. Neurosci. 25:1478, 1999.

250. CZYZYK, TA, KING, M, ZHANG, J, SCHULLER, A, PASTERNAK, GW, and PINTAR, JE: Production of combinatorial opioid receptor knockout mice. Soc. Neurosci. 25:179, 1999.

251. KOLESNIKOV, Y, and PASTERNAK, GW: Peripheral orphanin FQ/nociceptin analgesia in the mouse. Int.

Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

252. BOLAN, E, ZUCKERMAN A, de PAULIS, SCHMIDT, DE, SPECTOR, S, and PASTERNAK, GW: Characterization of morphine-6-sulfate and codein-6-sulfate. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

253. CRUCIANI, RA, ROSSI, GC, and PASTERNAK: Decreased morphine analgesia by antisense oligonucleotide to $G_s\alpha$. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

254. CHANG, AH, RYAN-MORO, J, ALTEMEMI, GF, STANDIFER, KM, and PASTERNAK, GW: Binding and functional profile of orphanin FQ/nociceptin in BE(2)c, human neuroblastoma cells. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

255. XU, J, PAN, Y-X, BOLAN, E, MAHURTER, L, LETCHWORTH, S, and PASTERNAK, GW: Expression of multiple splice variants of the mouse muopioid receptor (MOR-1) gene during ontogeny. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

256. ABBADIE, C, PAN, Y-X and PASTERNAK, GW: Distribution of a splice variant of the muopioid receptor-1, MOR-1D, in the murine CNS. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

257. SU, W, KING, AM, HOSZTAFI, S, GOLDBERG, IE, and PASTERNAK, GW: I vivo characterization of naloxone derivatives. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

258. ROSSI, GC, MATHIS, JP, SHANE, R, ALLEN, RG, BODNAR, RJ, and PASTERNAK, GW: Orphanin/FQ_{60-187} analgesia and hyperalgesia in the CD-1 mouse and the Sprague Dawley rat. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

259. PAN, Y-X, CHANG, E, BOLAN, E, MAHURTER, L, ROSSI, G, and PASTERNAK, GW: Cloning and expression of a novel splicevariant (MOR-1F) of the mouse mu-opioid receptor (MOR-1) gene. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

260. LETCHWORTH, SR, PAN, Y-X, ABBADIE, C, and PASTERNAK, GW: Distribution of KOR-3/ORL-1 splice variant transcripts in mouse brain. Int. Narcotics Res. Conf., Saratoga Springs, NY, July 10-15, 1999.

261. PAN, Y-X, XU, J, ROSSI, G, XU, M-M, MAHURTER, L, BOLAN, E, and PASTERNAK, GW: Differential expression of eight splicing variants are directed by a new promoter of the mouse mu opioidreceptor gene (MOR-1). Int. Narcotics Res. Conf.,Mon08, Seattle, WA, July 15-22, 2000.

262. BOHN, LM, BARAK, LS, ABBADIE, C, PAN, YX, PASTERNAK, GW and CARON, MG: Mu opioid receptor splice variant MOR1D, internalized after morphine treatment in HEK293 cells.Int. Narcotics Res. Conf., Sun42, Seattle, WA, July 15-22, 2000.

263. BOLAN, EA, PAN, YX, and PASTERNAK, GW: Examination of several alternatively spliced mu opioid receptor (MOR-1) isoforms in functional assays. Int. Narcotics Res. Conf., Sun44, Seattle,WA, July 15-22, 2000.

264. ROSSI, GC, CANNELLA, DT, PASTERNAK, GW, and POSNER, JB: Intracerebroventricular injection of anti sense HuD oligonucleotides in mice results in severe motor dysfunction and seizures. Int. Narcotics Res. Conf.30, Seattle, Mon56, WA, July 15-22, 2000.

265. NEILAN, CL, NGUYEN, TM-D, SCHILLER, PW, and PASTERNAK, GW: Pharmacological characterization of super DALDA, a potent μ-opioid analgesic. Int. Narcotics Res. Conf.,Mon30, Seattle, WA, July 15-22, 2000.

266. ABBADIE, C, GULTEKIN, SH, and PASTERNAK, GW: Immunohistochemical localization of a carboxy terminus epitope of the novel mu opioid receptor splice variant MOR1C within the human spinal cord. Int.

Narcotics Res. Conf., Sun15, Seattle, WA, July 15-22, 2000.

267. KING, MA, SU, W, CHANG, AH, ZUCKERMAN, A, BULLLOCK, S, MILO, SP, and PASTERNAK, GW: The effect of P-glycoprotein opiate transport and analgesia. Int. Narcotis Res. Conf., Mon27, Seattle, WA, July 15-22, 2000.

268. SHANE, R, LAZAR, D, ROSSI, GC, PASTERNAK, GW, and BODNAR, RJ: Multiple opioid receptor subtype antagonists affect orphanin FQ/Nociceptin analgesia in the rat amygdala. Soc. Neurosci. 26:158.1 l,New Orleans, LA, Nov. 4-9, 2000.

269. SILVA, RM, HADJIMARKOU, MM, ROSSI, GC, PASTERNAK, GW and BODARN, RJ: ∃-endorphin-induced feeding: Pharmacological analysis using opioid antagonists and antisense probes. Soc. Neurosci. 26:371.5,New Orleans, LA, Nov. 4-9, 2000.

270. KING, MA, SU, W, CHANG, AH, ZUCKERMAN, A, BULLOCK, S, MILO, SP and PASTERNAK, GW: The role of p-glycoprotein in the brain-to-blood transport and analgesia. Soc. Neurosci. 26:306.9,New Orleans, LA, Nov. 4-9, 2000.

271. ABBADIE, C, GULTEKIN, SH, and PASTERNAK, GW: Immunohistochemical localization of a caboxy terminus epitope of the novel mu opioid receptor splice variant MOR1C within the human spinal cord. Soc. Neurosci. 26:246.15, New Orleans, LA, Nov. 4-9, 2000.

272. BOLAN, EA, PAN, YX, and PASTERNAK, GW: Functional characterization of several alternatively spliced mu opioid receptor (MOR-1) isoforms. Soc. Neurosci. 26:44.4,New Orleans, LA, Nov. 4-9, 2000.

273. NITSCHE, JF, KING, MA, PASTERNAK, GW, and BODNAR, RJ: Opiate tolerance and dependence in DOR-1 and enkephalin null mice. Soc. Neurosci. 26:598.2,New Orleans, LA, Nov. 4-9, 2000.

274. NEILAN, CL, NGUYEN, TMD, SCHILLER, PW, POSNER, JB, and PASTERNAK, GW: SuperDALDA, a selective mu-opioid peptide, mediates high potency spinal analgesia. Soc. Neurosci. 26:598, New Orleans, LA, Nov. 4-9, 2000.

275. SU, W, KING, MA, HOSZTAFI, S, GOLDBERG, IE, and PASTERNAK, GW: In vivo characterization of methyl, ethyl and propyl-3-ethers of naloxone. Soc. Neurosci. 26:623.20,New Orleans, LA, Nov. 4-9, 2000.

276. CARON, MG, BOHN, LM, BARAK, LS, ABBADIE, C, PAN, YX, and PASTERNAK, GW: Mu opioid receptor spliced variant, MOR1D, internalizes after morphine treatment in HEK293 cells. Soc. Neurosci. 26:783.3,New Orleans, LA, Nov. 4-9, 2000.

277. HADJIMARKOU, MM, SILVA, RM, ROSSI, GC, PASTERNAK, GW and BODNAR, RJ: G-protein alpha subunit antisense probes differentially reduce food deprivation-induced intake in rats. Soc. Neurosci. 310.17, San Diego, CA, Nov. 10-15, 2001.

278. SILVA, RM, GROSSMAN, H, LIU, P, ROSSI, GC, PASTERNAK, GW and BODNAR, RJ: Pharmacological and molecular characterization of dynorphin-induced feeding in rats. Soc. Neurosci. 310.18, San Diego, CA, Nov. 10-15, 2001.

279. SU, W and PASTERNAK, GW: Peptide secretion from the brain to the blood: Role of multidrug resistance associated protein. Soc. Neurosci. 465.6, San Diego, CA, Nov. 10-15, 2001.

280. PAN, YX, XU, J, XU, MM, BOLAN, E, MAHURTER and PASTERNAK, GW: Isolation and characterization of a novel splice variant, Mor-1R, of the human mu opioid receptor gene (Oprm). Soc. Neurosci.,40.7, San Diego, CA, Nov. 10-15, 2001.

281. WALKER, M, PASTERNAK, GW, and GOODMAN, CW: Neuropeptide FF interaction in forskolinstimulated cAMP accumulation using morphine tolerant MOR1 CHO cells. Soc. Neurosci., 224.9, San Diego, CA, Nov. 10-15, 2001.

282. ABBADIE, C, HADJIMARKOU, PASTERNAK, GW and BODNAR, RJ: Selective upregulation of MOR-1C a mu-opioid receptor splice variant, in the paraventricular hypothalamic nucleus after food restriction in rats. Soc. Neurosci., 310.19, San Diego, CA, Nov. 10-15, 2001.

283. KING, AM, SU, W, MILO, SP and PASTERNAK, GW: P-glycoprotein modulation of opioid analgesia. Soc. Neurosci., 465.5, San Diego, CA, Nov. 10-15, Nov. 10-15, 2001.

284. NEILAN, CL, NGUYEN, TM-D, SCHILLER and PASTERNAK, GW: Binding of [3H] super DALDA to brain membranes. Soc. Neurosci., 465.7, San Diego, CA, Nov. 10-15, 2001.

285. GILBERT, AK, HOSZTAFI, KING, MA and PASTERNAK, GW: Pharmacological characterization of dihydroheroin and it metabolite 6acetyldihydromphine in mice. Soc. Neurosci., 614.18, San Diego, CA, Nov. 10-15, 2001.

286. KOLESNIKOV, Y and PASTERNAK, GW: Topical opioid and clonidine interaction in mice. Int. Narcotics Res. Conf., 1, Helsinki, Finland, July 1-19, 2001.

287. ROSSI, GC, PAN, Y-X, ABBADIE, C and PASTERNAK, GW: Differential effects of endomophin-1 and endomorphin-2 on behavioral activity: MOR-1 antisense profile. Int. Narcotics Res. Conf.,30, Helsinki, Finland, July 1-19, 2001.

288. PAN, Y-X, XU, J, XU, MM and PASTERNAK, GW: Identification and characterization of a novel splice variant, MOR-1R, of the human mu opioid receptor gene (Oprm). Int. Narcotics Res. Conf.7, Helsinki, Finland, July 1-19, 2001.

289. CHANG, F-C, PAN, YX and PASTERNAK, GW: Expression of the cloned mu opioid receptor MOR1 and its splice variants in lung. Int. Narcotics Res. Conf., 72, Helsinki, Finland, July 1-19, 2001.

290. NEILAN, CL, PINTAR, J, SCHILLER, P and PASTERNAK, GW: Differential sensitivities of mouse strains to morphine and [DMT^1] DALDA analgesia. Int. Narcotics Res. Conf.,1, Pacific Grove, CA, July 9-14, 2002.

291. PAN, Y-X, XU, J, MAHURTER, L, XU, MM and PASTERNAK, GW: Isolation and characterization of a new splice variant mMOR-1R of the mouse mu-opioid receptor gene. Int. Narcotics Res. Conf.,52, Pacific Grove, CA, July 9-14, 2002.

292. CHANG, F-C, PAN, Y-X and PASTERNAK, GW: Mu opioid receptor MOR-1 and its splice variants in thymus. Int. Narcotics Res. Conf., Pacific Grove,36, CA, July 9-14, 2002.

293. PINTAR, J, PENG, B, MORGAN, D, CZYZYK, T, NITSCHE, J, MZHAVIA, N, PASTERNAK, G, EIPPER, DEVI, L AND ALLEN, R: Mutual analysis of mice defective in endogenous opioid peptide production. Int. Narcotics Res. Conf., S10, Pacific Grove, CA, July 9-14, 2002.

294. NEILAN, CL, KING, MA, ANSONOFF, MA, PINTAR, JE, SCHILLER, PW and PASTERNAK, GW: Genetic backgrounds reveal differential sensitivities to morphine and [DMT^1] DALDA analgesia in mouse tail flick assay. Soc. Neurosci., 53.3, Orlando, FL, Nov. 2-7, 2002.

295. GROSSMAN, HC, HADJIMARKOU, MM, GIRAUDO, SQ, PASTERNAK, GW and BODNAR, RJ: Proopiomelanocortin gene products: Interactions of feeding response medicated by betaendorphin and alpha-melanocyte-stimulating hormone. Soc. Neurosci., 275.17, Orlando, FL, Nov. 2-7, 2002.

296. HADJIMARKOU, MM, KHAIMOVA, E, ROSSI, GC, PAN, YX, PASTERNAK, GW and BODNAR, RJ: Opioid receptor antisense probes differentially reduce deprivation-induced food intake in rats. Soc. Neurosci., 275.16, Orlando, FL, Nov. 2-7, 2002.

297. PAN, YX, XU, L, MAHURTER, L, XU, MM and PASTERNAK, GW: Cloning and expression of a new splice variant, MMOR-1R, of the mouse mu-opioid receptor gene. Soc. Neursci., 275.16, Orlando, FL, Nov. 2-7, 2002.

298. TOWART LA and PASTERNAK GW: Expression of mu opioid receptors in PC12 cells. Int. Narcotics Res. Conf., 6, Perpignan, France, July 6-11, 2003.

299. BOLAN, EA, PAN, Y-X and PASTERNAK, GW: Functional analysis of the COOH terminus splice variants of MOR-1. Int. Narcotics Res. Conf.,5, Perpignan, France, July 5-11, 2003.

300. GILBERT, A-K, GOUILL, CL, THOMPSON, C, PASTERNAK, GW, STANKOVA, J and ROLA-PLESZCZYNSKI, M: Expression and modulation of the cysteinylleukotriene receptor 1 (CYSLT1R) in the central nervous system. Soc. Neurosci.695.11, New Orleans, LA, Nov. 7-12, 2003.

301. MAHURTER, L, SPETEA, M, TOTH, F, SCHUTZ, J, OTVOS, F, SCHMIDHAMMER, H and PASTERNAK, GW: Binding of [^{3}H]14-methoxymetopon to calf brain membranes and CHO/MOR1 Splice Variants. Soc. Neurosci., 644.16, New Orleans, LA, Nov. 7-12, 2003.

302. CHANG, FC, ZHANG, Y, PAN, YX and PASTERNAK, GW: Identification and expression of six mu opioid receptor splice variants inmouse lung. Soc. Neurosci.,577.6, New Orleans, LA, Nov. 7-12, 2003.

303. PAN, YX, XU, J, BOLAN, E, MOSKOWITZ, H, ZHANG, Y, MAHURTER, L, XU, M and PASTERNAK, GW: Isolation and characterization of four new alternatively spliced variants from the mouse mu opid receptor gene. Soc. Neurosci., 577.1, New Orleans, LA, Nov. 7-12, 2003.

304. PREMKUMAR, A, PAN, Y and PASTERNAK, GW: Heterodimerization of MOR splice variants and orphanin FQ/nociceptin receptors. Soc. Neurosci.,577.5, New Orleans, LA, Nov. 7-12, 2003.

305. ZHANG, Y, PAN, YX and PASTERNAK, GW: Immunohistochemical distribution of a new alternatively spliced variant, mMOR-1B4, from the mouse mu opioid receptor gene (*OPRM*) in the mouse central nervous system. Soc. Neurosci., 577.3, New Orleans, LA, Nov. 7-12, 2003.

306. HADJIMARKOU, MM, ABBADIE, C, PAN, YX, PASTERNAK, GW, CROLL, SD and BODNAR, RJ: Time-dependent and site-specific upregulation of the MOR-1C opioid splice variant following food restriction in rats. Soc. Neurosci., 398.14, New Orleans, LA, Nov. 7-12, 2003.

307. PAN, L, PASTERNAK, DA, XU, J, XU, M, PAN, YX and PASTERNAK, GW: Identification and characterization of four new alternatively spliced variants from the rat mu opioid receptor gene *OPRM*. Soc. Neurosci., 577.2, New Orleans, LA, Nov. 7-12, 2003.

308. BOLAN, EA, PAN, YX and PASTERNAK, GW: Functional analysis of MOR-1 splice variants of the mu opioid receptor gene, *OPRM*. Soc. Neurosci., 577.4, New Orleans, LA, Nov. 7-12, 2003.

309. HADJIMARKOU, MM, SINGH, A, ISRAEL, Y, KANDOV, Y, ROSSI, GC, PAN, YX, PASTERNAK, GW, and BODNAR RJ: Food deprivation-induced feeding: selective opioid receptor antagonist and antisense oligodeoxynucleotides probe effects in mice and rats. Soc. Neurosci.

310. ISRAEL, Y, KANDOV, E, KHAIMOVA, E, KEST, A, LEWIS, SR, PASTERNAK, GW, PAN, Y-X, ROSSI, GC, and BODNAR, RJ: NPY-induced feeding: opioid modulation using antagonists and antisense probes in rats. Soc. Neurosci.

311. PREMKUMAR, A, KOVALYSHYN, I, PAN, Y-X, and PASTERNAK, GW: Interactions of orphanin FQ/nociception and delta opioid receptors: functional implications. Soc. Neurosci, 630.6, San Diego, CA, Oct. 24-27, 2004.

312. GAVISH, M, PREMKUMAR, A, PASTERNAK, GW, LESCHINER, S, SPANIER, I, WEISINGER, G, WEIZMAN, A, LEVINE, E, and VEENMAN, LJ: Enhancement of C6 glioma tumorigenicity by peripheral-type benzodiazepine receptor (PBR) antisense knockdown. Soc. Neurosci., 233.4, San Diego, CA, Oct. 24-27, 2004.

313. PAN, YX,: Characterization of the mouse mu opioid receptor exon 11 promoter and it relationships with exon 1 promoter in transgenic mice. INRC, Kyoto, Japan, July 18-24, 2004.

314. PAN, L, XU, J, RUI, R, YU, MM, PAN, YX, and PASTERNAK, GW: Identification and characterization of six new alternatively spliced variants from the human mu opioid receptor gene *Oprm*. INRC, Kyoto, Japan, July 18-24, 2004.

315. PAN, L, XU, J, YU, R, XU, MM, PASTERNAK, GW and PAN, YX: Isolation and expression of 6 new alternatively spliced variants from the human mu opioid receptor gene *Oprm*. Soc. Neurosci, 630.1, San Diego, CA, Oct. 24-27, 2004.

316. PAN, YX: Expression of the mouse mu opioid receptor exon 11 and exon 1 promoters in transgenic mice. Soc. Neurosci, 734.11, San Diego, CA, 2004.

317. TOWART, L, PAN, YX and PASTERNAK, GW: Expression of mu opioid receptor in PC12 cells. Soc. Neurosci., 630.10, San Diego, CA, 2004.

318. ZHANG, Y, PAN, YX, KOLESNIKOV, Y, and PASTERNAK, GW: Expression of the splice variants $_{m}$MOR-1 and $_{m}$MOR-1C from the mu opioid receptor gene, *OPRM*, in mouse dorsal root ganglia. Soc. Neurosci. 406.1, San Diego, CA, Oct. 24-27, 2004.

319. KIM, F, KOVALYSHYN, I, NEILAN, CL, PAN, YX and PASTERNAK, GW: Sigma-1 receptor modulation of opioid receptor pharmacology. Soc. Neurosci., 143.35, Washington, DC, Nov. 12-16, 2005.

320. KUZNETSOV, V, PREMKUMAR, A, VEENMAN, L, SPANIER, I, LESCHINER, S, PATERNAK, GW and GAVISH, M: The adenine nucleotide transporter (ANT) isoform 2 (ANT2) component of the peripheral-type benzodiazepine receptor (PBR) and glioma cell tumorigenicity. Soc. Neurosci., 673.4, Washington, DC, Nov. 12-16, 2005.

321. PAN, L, XU, J, XU, MM, PAN, YX and PASTERNAK, GW: Assessment of human mu opioid receptor splice variants through morphine-induced adenylyl cyclase superactivation. INRC, Annapolis, MD, July 10-15, 2005.

322. PAN, YX, XU, J, XU, MM, and PASTERNAK, GW: Functional characterization of an alternatively spliced variants MMOR-1B4, of the mouse mu opioid receptor gene, OPRM. INRC, Annapolis, MD, July 10-15, 2005.

323. PAN, L, XU, J, XU, MM, PAN, YX and PASTERNAK, GW: Effect of carboxyl termini in human mu opioid receptor splice variants on morphine-induced adenylyl cyclase superactivation. Soc. Neurosci.,374.8, Washington, DC, Nov. 12-16, 2005.

324. PAN, YX, XU, J, XU, MM and PASTERNAK, GW: Characterizing an alternatively spliced variants, mMOR 1B4, of the mouse mu opioid receptor gene, Oprm. Soc. Neurosci,374.10, Washington, DC, Nov. 12-16, 2005.

325. TOWART, L, PAN, YX and PASTERNAK, GW: Expression of mu opioid receptor in PC12 cells INRC, Annapolis, MD, July 10-15, 2005.

326. TOWART, l, PAN, and PASTERNAK, GW: Expression of mu opioid receptor in PC12 cells Soc. Neurosci.,

374.12, Washington, DC, Nov. 12-16, 2005.

327. ZHANG, Y, ZHANG, XX, KIM, F, and PASTERNAK, GW: The effect ofβ-Endorphin on the phenotypic maturation of bone marrow-derived dendritic cells. Soc. Neurosci. 994.10, Washington, DC, Nov. 1216, 2005.